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Veterinary Medicine

VOL. XXI OCTOBER, 1926 No. 10

Lexington Meeting of the A. V. M. A.

THE SIXTY-THIRD annual meeting of the American Veterinary Medical Association was held in Lexington, Ky., August 17th to 20th, 1926. This was the first meeting of the A. V. M. A. ever held in Kentucky; with the exception of the New Orleans meeting, the first held in the south in twenty-nine years; and the first held in the United States east of the Mississippi River in six years. For these and other reasons—the splendid program outlined for the meeting, the interest of the blue grass section to all veterinarians, and greater prosperity than the profession has experienced in very recent years—a large attendance was expected and fully materialized. Counting members, visitors and wives of veterinarians, the attendance was approximately 700.

Dr. W. W. Dimock and his local committee on arrangements made good on the seemingly extravagant promises that Dr. Dimock has been making the profession during the past two years. Higher praise could scarcely be given him and his colaborers for the very excellent manner in which the details of the reception, and entertainment and the provisions for the meeting were carried out.

The outstanding feature of the meeting was a visit to the famous breeding farms in Fayette County. A close second in importance as a feature, if we may judge from the newspaper reports, was the success of the newly created small animal section and in this, as he usually does, Dr. J. G. Horning of Houston, Texas, got away with the lion's share of the publicity with an article on a system of identifying dogs by means of nose prints, though to one attending the sessions of the small animal section, a number of other papers presented appeared to have more of practical value for the veterinarian.

The Lexington papers were unusually liberal in the allotment of space to the convention proceedings, and whereas one heard but little of the yearning for "publicity" that has reverberated so continuously at the last three or four meetings of the A. V. M. A., a great deal more publicity was attained than at the aforementioned meetings.

Officers for 1927

The election of officers developed a spirited contest. A total of 311 votes were cast, a very high percentage of those in attendance. The contest was a close one between Dr. Nelson S. Mayo of Chicago and Dr. T. A. Sigler of Greencastle, Ind., Doctor Sigler winning.

Other officers elected were: first vice-president, Dr. W. W. Dimock, Lexington, Ky.; second vice-president, Lt. Col. Wm. P. Hill, Washington, D. C.; third vice-president, Dr. Benjamin McInnes, Charleston, S. C.; fourth vice-president, Dr. J. C. Flynn, Kansas City, Mo.; fifth vice-president, Dr. Wm. Bell, Nashville, Tenn.; treasurer, Dr. M. Jacob, Knoxville, Tenn.

Officers selected for the various sections were as follows: General Practice—chairman, Dr. J. N. Frost, Ithaca, N. Y.; secretary, Dr. E. P. Althouse, Sunbury, Pa. Sanitary Science and Food Hygiene—chairman, Dr. E. A. Cahill, Indianapolis, Ind.; secretary, Dr. N. F. Williams, Fort Worth, Texas. Education and Research—chairman, Dr. E. M. Pickens, College Park, Md.; secretary, Dr. R. A. Runnells, Blacksburg, Va. Small Animal

Practice—chairman, Dr. F. R. Whipple, Peoria, Ill.; secretary, Dr. H. J. Milks, Ithaca, N. Y.

The new president is well qualified for the position and eminently deserving of the honor. For twenty-five years, he has been a successful practitioner at Greencastle, where he was also engaged in breeding and marketing jacks. He has an extensive surgical practice as a consultant and has had teaching experience in both the Terre Haute and Indiana Veterinary Colleges. He has served as president of the Indiana Veterinary Medical Association and as a member of the Indiana State Board of Veterinary Examiners.

In the United States Live Stock Sanitary Association he has been a prominent figure for a decade. His most signal service to the veterinary profession was probably rendered at the time of the 1914-15 outbreak of foot-and-mouth disease. The methods of the U. S. Bureau of Animal Industry in handling the outbreak were being strenuously opposed by the dairy interests and with considerable success. One of the points made against the Bureau was that the appraisers were incompetent and not informed as to types, breeds and values of dairy cattle, but when it was shown that the appraiser in question was Doctor Sigler, his qualifications for the place were so well recognized and his prestige with the live stock interests of Indiana so great, that the opposition to this phase of the work melted away at once. As a horseman and a judge of horses at fairs and live stock expositions, Dr. Sigler bears an enviable reputation. His interest in live stock is attested to by the fact that he is an ex-president of the Indiana Horse Breeders Association.

Philadelphia the Next Meeting Place

It was decided that the 1927 meeting should be held in Philadelphia, and there was the usual talk from the floor urging upon the executive board the advantages of holding the annual meetings in late September or October. These pleas for meetings at a more comfortable season come up with regularity during a torrid session, and the weather was certainly torrid as might have been expected at Lexington, but nothing ever seems to come of it. If history repeats itself, the executive board will meet in Chicago in December, turn up the collars of their overcoats and decide to go to Philadelphia about July 20th. The fact is, the prospect of an uncomfortable meeting keeps many from attending. Had the Lexington meeting been held nine or ten weeks later in the season, it is possible the attendance would have been fifty per cent. greater.

Participation of Army Veterinarians

The army veterinary corps was well represented at the meeting, numbering among those in attendance Col. Ray J. Stanclift, Lt. Col. Robt. Vans Agnew, Majors A. Mitchell and Geo. H. Koon, Captains R. I. Lovell, Nathan M. Neate and C. B. Dunphy. By resolution the association went on record as favoring legislation that would have for its object the rank of first lieutenant for veterinarians on being commissioned in the army instead of second lieutenant as is now the case, and the temporary grade of brigadier general for the director of the veterinary corps.

The Association Prospered During the Year

The growth of the association during the past year or rather the very small loss in membership is gratifying. There are those that have pointed out that the association has steadily lost in membership for nearly a decade, but it should be kept in mind that the loss has been in actual numbers only and not in relation to the veterinary profession as a whole. Ten years ago, the number of veterinarians was increasing faster than the membership of the association. Of recent years, the loss in the veterinary profession has been proportionately greater than the loss to the association. Another way of putting it would be to say that there are now fewer veterinarians qualified for membership

outside of the association than there were last year, and that despite the loss in numbers of the veterinary profession, as a whole during the year, the A. V. M. A. almost held its own.

Presidential Address

The presidential address by Dr. John Adams was singularly free from the propaganda of despair that has been so widely current in the profession for the past two or three years, and also from extended directions for the improvement and management of the association for all time to come. It was interesting as it was unusual. To quote:

"The past year has been kind to us. Industry in all lines has been active, wages have been high, unemployment low, prices even to the farmer fair and, more to the point, our domesticated animals have shown a commensurate increase in numbers, quality and value. Glanders and dourine are practically extinct. Rabies can be controlled. Contagious abortion is under intensive study and investigation and much has been learned as to its cause, course and control. Tuberculosis in cattle, swine and poultry is engaging the attention of our foremost laboratory workers, sanitarians and breeders, and much has been learned of type, cultural peculiarities, modes of transmission, habitat and virulence of the tubercle bacillus. Area testing of cattle is slowly but just as surely eating away infected territory. The accredited-herd plan is finding favor with owners. In every branch of our varied activities, in every field of our endeavor, there has been more to do, at better compensation than ever before. As a whole, our profession has been prosperous."

And again: "We are rapidly adjusting ourselves to the new conditions imposed upon us. Few complaints have come from practitioners capable of rendering proper service."

Lost Practice Result of Exorbitant Prices

And once more: "The live stock owner has learned considerable of the nature of infection, modes of transmission, the danger of unclean hands and soiled instruments. He knows the price of gasoline, the cost of viruses and sera. Furthermore, he expects professional service of the highest grade, and he knows when he does not receive it. He expects to pay well for good service, but he knows when he is stung. What is the result of incompetent service or competent service at exorbitant rates? The stock owner naturally looks elsewhere for help. He asks aid of the county agent, or of the teacher of veterinary science in his state agricultural school. This is the story as I have had it, direct from several intelligent and honorable stock owners in our central western states."

If the speaker sounded any note of warning, it was in connection with the growing influence of members of the association engaged in commercial lines. To quote again: "The commercial territory cannot hope to be annexed or incorporated within the domain of pure science. The fundamental principles of the two governments are unalterably opposed. The commercial territory will dicker. The domain of veterinary science cannot. Those of us who are members of his honorable body and are at the same time engaged in the sale of supplies to the profession as a means of livelihood are, to say the least, in an anomalous position. 'No man can serve two masters'."

Two-thirds of the Schools Should Close Their Doors

Perhaps his most surprising statement was with regard to the veterinary schools in America, concerning which he said: "I am not in favor of trying to sell the veterinary profession to young men. I doubt its wisdom and its success. The inexorable law of supply and demand will adjust matters in due time. I have heard no appeal for competition from veterinarians, nor for veterinary service from stockmen. If the latter need service which they cannot get, let them send their sons to a veterinary school.

"We do not need more schools, but a few with superior equipment, comprehensive curricula and able and inspiring teachers. We must pay our teachers and research workers very much better salaries if we are to attract the best and provide the peace of mind requisite for the desired result.

"By comparison with European countries, we have too many schools attempting to turn out veterinarians. The ideal number for the United States would be four or five high grade, somewhat better equipped and manned than our best schools of today. One should be in the East, another in the far West, a third in the South and a fourth and perhaps a fifth in the Central West."

He complimented the general practitioner upon being the backbone of our profession and destined to occupy this position for years to come. The end product of our educational system. And ended with this tribute to the profession. "I wish to assure you that I have been profoundly sincere, without malice or prejudice and deeply sympathetic. I love the veterinary profession. It completely fills my being. It satisfies my noblest longings—all my soul's desires.

"Education, culture, sincerity, probity, industry, sympathy, friendliness and reverence for the Divine Creator of all things are the golden stepping stones by which we shall rise to the estate of usefulness and honor."

A Tour of Noted Breeding Farms

The most interesting part of the meeting and a thing that could have been offered those visiting the association nowhere else was a visit to a number of the famous breeding farms near Lexington. Starting immediately after lunch on August 19th, the veterinarians and such of the womenfolk as cared to go were conveyed in automobiles supplied by the townsfolk to Idle Hour Stock Farm, owned by Col. E. R. Bradley, owner of Bubbling Over, Bagnbaggage, Boot to Boot, all Derby winners this year. The visitors were shown the Horace N. Davis farm where On Watch is quartered. The visitors saw Colonel Bradley's new purchase, the Patrick farm of more than 600 acres, which he is converting into a modern horse breeding establishment and which will be connected by an underground subway with Idle Hour Farm across the road. Manager Barry Shannon personally met the veterinarians and their ladies at the office at Idle Hour, showing them the modern training stable and barns near by.

They saw the six furlongs private track where Behave Yourself and Bubbling Over, Kentucky Derby winners, were trained. Black Toney and North Star, III, sires of Derby winners and Black Servant which ran second to Behave Yourself in the American turf classic were led out for inspection of the visiting veterinarians who expressed delight at the opportunity of seeing the famous thoroughbreds in their own quarters.

Passing the famous nurseries of H. F. Hillenmeyer & Sons, the visitors passed J. L. Tarlton's farm at the Georgetown and Sanderville pike where lives Peter Scott, famous trotting horse. Enroute to Walnut Hall Farm, the horse lovers were shown the Nursery farm, formerly conducted by August Belmont where Man O' War was foaled. At Walnut Hall, owned by Dr. O. M. Edwards, of Pittsburg, Pa., known as the greatest trotting horse establishment in the world, the visitors saw Peter Volo, Guy Axworthy, San Francisco, Chestnut Peter and McGregor the Great. Among the great horses bred at Walnut Hall are Peter Maltby, Trumpet, Walnut Hall and many others.

The tour then proceeded to Faraway Farm, where they saw Man O' War, called "the horse of the century" and "the greatest race horse in the world," which is gaining fame as a great sire of great racing sons and daughters, including Crusader, Mars, Edith Cavell, American Flag, champion three-year-old of 1925, and Scapa Flow. Many veterinarians registered in Man O' War's guest book, which includes names of persons from all parts of the world.

The motorists then proceeded to the Iron Works pike, passing Hinata Farm, conducted by W. R. Coe, eastern sportsman where stands Friar Rock and other notable stallions and where Pompey was raised; Donegal Farm owned by Senator J. W. Bailey, of Texas, and to Elmendorf Farm, vast breeding establishment owned by J. E. Widener, Philadelphia sportsman, where they saw Stefan the Great, Mr. Widener's imported stallion, Mont d'Or, imported stallion and Fair Play, sire of Man O' War. They next visited H. P. Whitney's farm on the Paris pike to inspect Chicle, Broomstick, Mad Hatter, Peter Pan and Pennant.

Benesch's Suggestions

There can be little doubt that the most valuable offering of the Lexington meeting to the practitioner was the discussion of bovine obstetrics by Prof. Franz Benesch, head of the department of obstetrics of the veterinary school of Vienna.

Professor Benesch is pursuing the study of American veterinary methods at Cornell Veterinary College as a result of a travelling fellowship granted by the International Education Board, founded by John D. Rockefeller, Jr., three years ago.

Professor Benesch's lecture at the Lexington meeting was extemporaneous and delivered in German. Dr. John Adams interpreted for the Professor and at times supplemented the thoughts of the lecturer from his own experience with the methods.

One point of great usefulness to his hearers was a new method of anesthesia for the genitalia of the cow described by Benesch. By this method a three-quarters of one per cent. solution of procain is used. Thirty cc. for a large cow and graduated down to 20 cc. for a small cow is injected into the epidural tissues of the tail.

By the Professor's method, the technic is very simple. The site of injection is a point between the first and second coccygeal vertebrae. This point may be determined by grasping the tail with the hand and moving it up and down. The point at which movement ceases is this first coccygeal articulation. Or it may be felt by passing the hand firmly over the region. The articulation in question is marked by a greater depression than other articulations of the sacrum and tail and exhibits a soft spot to the touch.

Having located the proper place for the injection, a hypodermic needle is placed perpendicularly at the lowest point of the funicular depression and inserted till it meets a solid obstruction. It is then withdrawn slightly and the injection made at body temperature.

The procedure is wholly without harm or danger to the animal if aseptic precautions are observed. The anesthesia occurs in twelve to fifteen minutes and is profound for the parts affected. It lasts an hour to an hour and a half and has many uses. For example, in cases of everted uterus, it stops all straining, greatly facilitating the replacement of the organ. The long period of anesthesia following the replacement of the organ, permits the engorgement to subside and involution to take place to a degree that by the time the anesthesia has passed the desire to strain will also have passed, and no appliances are necessary to prevent a re-eversion.

If the operation, whatever it may be, is to be performed on the animal standing, it is important that the quantity of the solution injected be carefully graduated as mentioned in the foregoing. If a larger quantity be injected, some of the solution will find its way forward and paralyze the hind legs and the animal will go down.

If anesthesia for operation on the hind legs be desired, twice the quantity given in the foregoing should be used. In this case the anesthesia will be somewhat prolonged.

A New Embryotome

Professor Benesch exhibited a universal embryotome of his own design. It consists of a fine wire saw passed through a specially constructed tube of about arm's length. The Professor assured his hearers that it was easy to place in posi-

tion, safe for the dam and quickly effective in severing the head or legs from a calf or for cutting through the body. He said he could easily amputate a man's leg with it and offered to demonstrate if any present would furnish a leg. Apparently everyone present believed the instrument would do what the distinguished obstetrician claimed for it and no one volunteered a leg for the test.

The instrument is manufactured by Hauptner of Berlin and in Germany is quite inexpensive. Sharp & Smith will distribute it in this country.

Professor Benesch was elected to honorary membership in the A. V. M. A., as was also Professor W. A. Macburg of Copenhagen, and Professor Josef Marek of Vienna.

Reduced Railroad Fare a Delusion

The certificate plan of transportation, that vague and elusive promise of reduced railroad fare for those attending the meeting, fell down by a very wide margin. This meeting probably marks the end of any prospect of it. Too few attend the meetings from distant points to render the plan workable, and those living within 300 miles of the places where the meetings are held, generally drive.

The Sesqui-centennial at Philadelphia should get well under way by the time the next meeting is held, and reduced fares to that will probably be in effect.

The annual malarial death toll is approximately two million people.

High blood pressure is not pathognomonic of interstitial nephritis. This condition may be due to disturbances of internal secretions, poison of metabolic origin, and other disorders including nephritis.

Tuberculosis of bones and joints is extremely rare in children in tropical countries. This may be due to the exposure to tropical sunshine and little interference of clothing.

There is much discussion in current literature relative to whether or not cancer is infectious and the value of serum treatment. If cancer is infectious, why is it that surgeons do not become infected?

Chronology of Ancylostoma duodenale (human hookwork)—Discovered 1838. Relation to disease recognized 1853. Development of larvae outside of body observed 1866. Method of detecting (diagnosis) 1877. Entrance of larvae through the skin observed 1898.

Cancer may be the result of a vitamin unbalance. Normal growth and function depend on a proper balance between vitamin B that stimulates growth and vitamin A that prohibits growth.

PASTEURIZATION OF MILK IN NEW YORK

In 1914, the pasteurization of milk in New York except that termed "certified," was made obligatory by law. A decline in the nonpulmonary tuberculosis death rates has occurred since this law became effective. The bulletin of the city health department states that in 1911 there were 1,460 deaths from nonpulmonary tuberculosis, and in 1925 only 699. Previous to the pasteurization of milk, more than 50 per cent. of the tuberculous glands of the neck investigated were due to the bovine bacillus; since pasteurization became general, only in six out of fifty specimens obtained has the bovine bacillus been found, and five of these patients were from out of town and had been fed on raw milk. The health authorities are considering the subject of pasteurization in view of the recent action of the Conference of State and Provincial Health Authorities of North America, which agreed on a temperature of 145° F. maintained for thirty minutes. The requirement in New York is 142° F., and the commercial interests are protesting against a higher standard, which, they say, will require the installation of new equipment and increase the cost of milk. The health commissioner will make a decision after consideration of opposing views and conferences with persons qualified to give counsel.—Journal A. M. A., Sept. 11, 1926.

A Few Cases in Western Practice

E. T. BAKER, Moscow, Idaho

THE ACCOMPANYING snapshots were made with a 3A Graflex, 6.3 B. & L. lens, using one seventy-fifth of a second, with the stop at from 11 to 16. The cases were attended to during

Case No. 1. Chronic hemorrhagic septicemia.

June, July and August, and are abstracted from some 300 calls made during those months.

Case No. 1

A neighboring veterinarian called me in to look at some purebred bucks. Out of 153 head running in a wooded pasture, twelve had ceased to live, eleven dying in one day. There were about five of the balance that looked like the breaking up of a hard winter, and held their heads like the gentleman shown in the picture.

An autopsy performed on several of the deceased bucks revealed large abscesses in the lungs, with the adjacent tissues more or less discolored. However, as a dead sheep gives about as much information as a government crop report, we proceeded to look at some of the sick ones.

One old broken toothed Rambouillet showed a temperature of 106° F. Another had 105°. We took the temperature of some of the apparently healthy ones, and they ran around 102° to 103°.

Throwing the old buck on the ground under a big yellow pine, his neck was rudely slashed and the vertebrae broken. He failed to survive this rough treatment, and after a short time passed away. We caught a little blood and placed this in a five-pound lard pail that had been thoroughly sterilized in some spring water. In another bucket we placed the pluck (heart, lungs, some liver and part of a kidney). We sprinkled some powdered boric acid over these specimens and brought them to the bacteriological laboratory of the University of Idaho. Our diagnosis was hemorrhagic septicemia of the pulmonary, chronic type, and the surviving sheep were given a shot of bacterin, to be followed in five days by

Case No. 2. Complete uterine eversion.

the aggressin. No more trouble has since taken place among these animals.

Inoculations were made in three rabbits at the laboratory, and death took place in thirty-six hours. Slides showed some very typical ovisepticus, showing good bi-polar stain.

Hemorrhagic septicemia can exhibit a number of types. Whether it is a primary infection, or jumps in after the

Case No. 3. Dysentery in coyote pup.

animal's resistance is at a low ebb, is a question to be decided.

Case No. 2

One morning, just after the Fourth of July, when the weather was around 100 in the shade, we received a call from an excited client who told us he had just found his fresh cow with "her whole works out." We gave a groan and said a few words under our breath that the preacher uses, only he uses them differently, and sadly jumped into the Buick.

It was worse than we expected. The cow had calved during the night, and the eversion had taken place no one just knows when, but the poor animal had wandered over a hundred-acre pasture for some hours.

Tying her to a tree, we gave her two ounces of chloral by the mouth and a quarter grain lobelin hypodermically. We had her faced down hill, so that when she lay down, we did not have to raise her up. We washed off the mass as well as we could with a potassium permanganate solution, and then with a good, stout helper, began to replace it. After much toil and sweating and profanity we finally got it back in place, and then injected about two gallons of rather warm but weak carbo-campho solution to balloon the uterus in position. We then inserted a uterine capsule, and took three sutures through the vulva with picture wire, and left a man to keep her down for some time.

He said she remained quiet for nearly five hours, and then got up, drank freely and ate a gallon of rolled oats. She strained very little and made a good recovery. She was of a range, Shorthorn type. Small, nervous Jerseys usually die getting well.

Case No. 3

Some sheep herders had captured a coyote pup, and the little fellow had a bad case of dysentery, passing almost pure blood. A mixture of catechu, milk of magnesia and essense of peppermint, with reduced rations, soon brought him out in fine shape. He later returned the kindness, I understand, by killing some lambs, and almost wrecking one of the Australian sheep dogs.

Case No. 4

A large, robust mule had a sore eye. His owner had thrown a handful of salt in it, he explained, and the mule seemed to be shy ever since. In fact, whenever one came near his head, he "rared" back, and evinced a sincere desire to be left alone. His front feet were very active, and I was warned to "look out fer that there cuss."

I used to dread these cases, and it is a

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yonder now to me that I was not kicked into the Pacific Ocean in the earlier days of practice.

Snubbing Mr. Mule up to a pole in the stall, we slipped a twitch on his nose, and then washed off the salt and other secretions with warm boric acid solution, in which had been dissolved several tablets of quinin and urea hydrochlorid. Gently handling the eyelid, we turned it back a little and inserted a grain tablet of the quinin and urea in the inner canthus. We then released the twitched animal, and worked on a couple of cases of enamel points. Coming back, we were able to see what the trouble was, which happened to be an oat hull adherent to

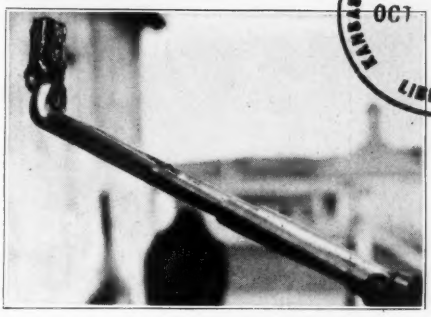
Case No. 4. Foreign object in eye.

the cornea. Twitching him again in order to take no chances, we finally picked the hull off with a small artery forceps.

We left a two-ounce bottle containing two grains each of zinc sulphate, quinin and urea, in one ounce each of camphor water and boric acid solution. In about a week, the eye was normal, except for a little white spot, which was cleared up by dusting with powdered calomel.

Case No. 5

A big, five-year-old mare had an abscess on the lower right jaw. Examination revealed the first molar greatly enlarged and carious. Backing her in the stall, a



Case No. 5. An overgrown tooth.

twitch was applied and the biggest tooth we have ever extracted finally came out, after some mighty tugging. It measured over four inches in length, and was twice as large as normal. The odor resembled that of a packing house on a sultry evening. Leaving the owner some red oil to inject into the sore from the outside we looked at her in a month, and found the jaw healed nicely. However, unless you like hard work, don't tackle any but the first molar. Trephining is a hospital job, for the after care will make your client an enemy for life.

Case No. 6

A fine young mule had been cut above the right knee with a disc, although not seriously or deep. The owner had squirted in some wire cut dope he always used, but the animal got well no faster, he said. Swelling now took place, and when we arrived we advised a thirty-thirty, which was used. We took a specimen of the blood to the bacteriological laboratory,

Case No. 6. Malignant edema.

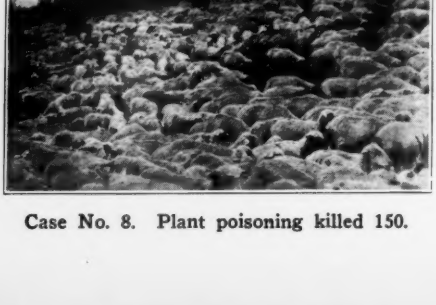
Case No. 7. What is this?

where a microscopical examination revealed malignant edema.

Case No. 7

In baseball parlance, we now come to the lucky seventh. Just what this condition is or was we do not know. We have a case every so often, and notice that if the swelling goes down on the brisket, we usually have a funeral.

The patient, a four-year-old grade Guernsey, was apparently in good health at night. She gave about two gallons at a milking. The next morning she only gave a pint of milk, and when the owner examined her, he found her "all swelled up around the neck and head, with one eye closed." When we saw her, about the middle of the forenoon, small vesicles had appeared on the skin of the neck, and the throat was swelled like a case of purpura. Her temperature was 104°F. We gave her a shot of mixed infection



Case No. 8. Plant poisoning killed 150.

bacterin, a physic, and bathed the parts in white lotion with belladonna. Camphor water was applied to the eyes. In about a day she seemed much better. In a week she had recovered.

Is this a form of purpura, weed poisoning, snake bite, bee sting, hives, erysipelas, rash, erythema, or grass widow hay fever?

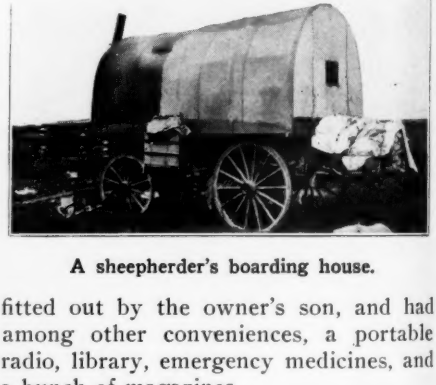
Case No. 8

We were called up in a forest reserve to see a band of 2,000 sheep. In less than a week over 150 had died. All we could find was a wild pea, which seemed quite thick. We advised moving the sheep to another side of the mountain, which was done, and the losses ceased. One hundred dollars added to the bank account.

When you are called to a case where you do not know what is the matter, advise moving the animals.

Other Photos

The snapshot of the chuck wagon shows a sheep herder's boarding house for the summer range. This one had been



A sheepherder's boarding house.

fitted out by the owner's son, and had among other conveniences, a portable radio, library, emergency medicines, and a bunch of magazines.

The photo of the brook is that of Orofino creek, in northern Idaho, where gold was first discovered in this state in 1860. Capt. Pierce, an old prospector, had married a Nez Perce squaw, and she had mentioned to him about her relatives finding gold along this creek. The old captain took her word for it, and moved up to the locality friend wife indicated. Pierce City,

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Orofino Creek, where gold was first discovered in Idaho in 1860.

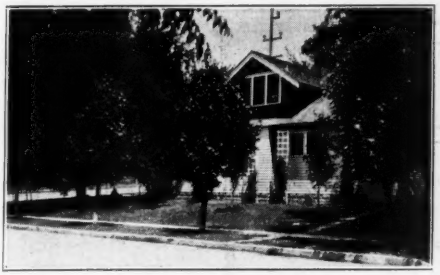
a boom town of the sixties, now became the center of a great gold rush, and contained at one time over ten thousand souls, not counting Chinamen. At the present time, it is a relic of the past, with but a few people, although it is reviving due to a railroad being built through it to a big white pine belt. Thousands of sheep are grazed here during the summer, and it is a paradise for hunters and fishermen.

The last picture is a snapshot of our home in Idaho. Moscow is a modern western town of some 4,000 people, and contains the state university, which has a beautiful campus, and a student body of some two thousand. Nine miles from here, just across the state line, is the State College of Washington. We might whisper that there is a little rivalry between the two institutions, especially at football seasons.

Moscow is 90 miles south of Spokane, about 200 miles south of the Canadian line, and some 300 miles from the Pacific coast. We are 1,400 miles from Los Angeles, but can make the trip in five days over a paved or gravelled highway from here.

Conditions in the northwest for veterinarians have been rather poor the past few years. With horses at low price; with thousands of farmers going broke buying the high-priced land, and with many banks "busted," the veterinarian, who weathered the storm had to have a good locality.

But, as the movies say, "came the dawn of a new day," and we will close.



Residence of Dr. E. T. Baker, corner Sixth and Washington Sts., Moscow, Idaho.

Cattle grubs or warbles cost the cattle industry at least $50,000,000 annually due to loss of condition incident to annoyance from deposit of eggs, irritation produced by the larvae, and the damage to hides. The most successful method of control of this pest is the destruction of the larval parasite before it emerges through the skin.

A fish flour made from fish and fish refuse containing approximately 3% of fat, 17% mineral substance, and 65% protein, has been found of value not only as a concentrate for swine but also for cattle. From two to three pounds of the flour should be added to the ration daily to obtain the best results.

BETTER MILK

The increased consumption of a better grade of milk, in itself an important result, was brought about in eight Alabama cities that adopted the standard milk ordinance recommended by the United States Public Health Service, although the fundamental purpose was the production of safe milk under approved sanitary conditions.

During a two year period in these cities, the general milk sanitation rating increased 85 per cent, the production sanitation 70 per cent and the amount of market consumption 50 per cent according to the report from the committees on a standard milk sanitation program.—Bulletin, Ohio Public Health Association.

Sterility in Cows*

S. L. STEWART, Olathe, Kansas

STERILITY is a condition, which may be caused by gross anatomical defects, lack of development, lowered vitality, mal-nutrition, lacerations and constrictions of various kinds, overfat and bacterial diseases. The results are non-productivity and may occur at any stage of life, as a primary or secondary cause of barrenness. The causative factors that go to make up the disease complex are receiving more attention every day and undoubtedly will have a great weight in future treatment.

The factors that cause sterility may have been present from the beginning of life, in the embryo, in the development of the fetus, or the cause may have been contracted after birth and during any stage of the life of the cow. The largest percentage of barrenness in cattle is contracted in adult life, except possibly in a few herds infected with an unusually virulent strain of the B. abortus, when on account of fetal infection the percentage of infections may then be changed back to uterine life, in those herds so affected.

Sterility may be a condition of life-long barrenness, or it may be a condition developed after a period of fertility and of long fruitfulness. The productive period of life may be only long enough to reproduce once, or it may be for the greater part of the animal's life, then after many reproductions to end in sterility.

Sterility may be caused by a congenital defect and of a temporary or permanent character. The temporary forms are amenable to treatment usually at any stage of life, but if not properly treated they usually remain permanently sterile.

Temporary or permanent sterility depends upon the cause and tissues affected, the length of time involved and upon the proper treatment for the existing condition. Therefore, a case of sterility should be studied closely in order to diagnose the existing condition as well as identifying the cause, before a prognosis is made, or treatment recommended. The first essential thing is to obtain the history of the case, which should include the cow's age, number of calves she has produced and if all were alive at birth, if some were not, how many abortions, how long since she aborted the last time, how many times she has been bred since she last aborted, and if the bull is a sure breeder. By the time the history is obtained a decision as to the line of examination has been determined, and frequently the history will guide the diagnostician directly to the cause of sterility.

When the examination has been completed and a diagnosis of the cause of sterility is made, one should then be in a position to recommend treatment.

If the case is one of deformity, a lack of development of any of the generative organs, or, in the adult, the presence of cancerous tumors, incurable diseases or conditions, the owner should be advised as to the incurability of the case and recommendations made to send the animal to slaughter.

I recall the case of a registered Holstein cow that had given birth to two fine living calves, and then became sterile. She was sent 30 miles by truck and bred twice, but did not conceive. Upon her third estrum, I was called to examine the cow and found a growth in the right horn. On account of the honeycombed peculiarity of the growth I advised that she be sent to slaughter. But as the cow was valuable the owner declined and insisted that I treat her. I then treated the cow by lightly massaging the ovaries and uterus, except the tumorous part. In about six weeks from that date I was again called to see the same cow, and upon examination I found the tumor much larger, now the size of a half-gallon measure. The cow was losing flesh rapidly and again I advised her slaughter, but the owner again refused. I

* Presented at Kansas Veterinary Medical Association meeting, Jan. 6, 7, 1926.

then drew samples of blood and made blood smears and sent the blood sample, slides and history to a laboratory for diagnosis. The laboratory advised that the blood indicated a cancerous growth of some character. The cow then was sent to slaughter and the tumor proved to be a large spindle cell sarcoma.

Some cases of deformity readily yield to treatment—over-developed hymen, some cases of atresia vulva, etc. But only few heifers or cows with any part of the genitalia undeveloped conceive before or after treatment. Therefore, the percentage of deformities that do conceive and give birth to a normal live calf is too small to recommend treatment, except in cases of unusual blood lines when usually all rules are cast aside.

Sterility in the large majority of cases develops during the adult life of the cow, and usually following infection of some character, retention of the after birth, retained corpus luteum or laceration of some part along the genital canal and improper treatment during parturition or improper removal of the afterbirth.

A number of known species of micro-organisms are capable of invading the genital tract of cattle, according to the best available evidence, and capable of attaining such intensity as to interfere seriously with the reproductive functions. Some of these organisms may reside indefinitely in the genital tract without causing disaster or sterility, but ready at any time, taking advantage of an injury or loss of vigor in the entire animal or in the area occupied to cause serious harm; especially is this true in cases of retained afterbirth. Some varieties of these bacteria seem to be associated or developed to a greater number and virulency by infection of the B. abortus of Bang. However, pyometra is common in dairy herds when retained afterbirths are not properly removed and the cows properly treated, even though no infectious abortion be present in the herd. Here I would like to lay stress on what I have frequently said "that retention of the afterbirth depends upon an inflammation, which is caused by some kind of infection."

When the fetal membranes are retained, the dead tissues furnish the very best field for growth of all the flora of the genital canal. The pus-producing bacteria and bacteria of decomposition seem to lead them all in the art of developing and within a few hours' time the membranes begin to undergo putrefaction. The affected animal's resistance is diminished and it becomes subject to a variety of conditions and then the increasing inflammation present may be and often becomes sufficiently severe to render the animal sterile.

Any one part of the genitalia may be affected sufficiently to cause sterility and the remainder of the genitalia may upon examination appear to be normal, at least to the extent that the animal will conceive and produce a live calf if the affected part can be effectually treated.

My observations of sterility and especially infectious abortion have been more or less extensive and have led me to the conclusion that the greatest service a veterinarian can render the cattle industry at the present time lies first in his art of teaching the cattle breeders to breed nothing but healthy cows and bulls, and buy nothing but healthy cattle to build up their herds, and second in importance is a proper diagnosis of the existing condition causing sterility in each individual animal in the herd before any treatment is attempted.

In herds where infectious abortion is prevalent, a large percentage of the aborters will in time become sterile. The existing sterility is not primarily caused by the B. abortus of Bang but may be a secondary effect. That is, the B. abortus of itself does not prevent conception, but does destroy the life of the embryo or fetus and also causes premature births and weak calves, thereby giving ample opportunity to all other bacteria present to get in their work, which frequently causes metritis and retained afterbirth, pyometra, cervicitis, salpingitis, oophoritis of varying characters, which frequently ends in sterility.

In summing up the causes of sterility, one finds that the etiologic factors are numerous, and unless a careful examination is made, the cause may not be identified, then the diagnosis and prognosis may be in error. Infectious abortion is so very common and so

many times the secondary factor of sterility, that if the disease is suspected a serological blood test "while not absolute" is of great diagnostic value and should be made of each individual animal that aborts if not of the entire herd. Also, a complete physical examination of sterile cows should be made in order that the veterinarian may be able to get at the bottom of the difficulty as soon as possible.

Treatment of sterility depends entirely upon the cause. Therefore, a discussion on treatment of all causes would be unusually lengthy and a consumer of much time. Therefore, I shall confine my discussion on treatment in a general way to infectious abortion, as it is by far the greatest indirect cause of sterility.

There is a common belief in an acquired immunity against abortion. That is, it is stated that after a cow has aborted once, she is not so liable to abort again. The assertion has been made and remade so often and persistently that by mere repetition it has virtually acquired the force of a fact. But it is a perverted fact. In all data I have been able to obtain, it has been shown clearly that a given number of cows which aborted the previous year are more likely to abort again next year. A far larger proportion of the aborters fail to breed the second and third years and an increasing number are found to be sterile.

Quoting Dr. W. L. Williams, "The cattle industry demands a cure, and as a consequence the United States Bureau of Animal Industry, and the agricultural experiment stations are expected to advise dairymen and cattle breeders how to control losses from contagious abortion. Not only do laymen who are suffering economic losses demand a remedy, but they expect measures which the dairyman or breeder can successfully apply. The result is that much advice is given without visible benefit." For it is a fact that infectious abortion has increased in this country by leaps and bounds and no disease of cattle causes a heavier loss to the dairy and beef industry. Many owners have been forced out of business on account of infectious abortion and sterility which so often follows. It is said that the loss annually on milk only in the state of Pennsylvania alone is estimated at $5,000,000.00, and no doubt Kansas has a comparatively big loss each year.

If one could only see and read the pages of all the literature that passes through the United States mail on fake and quack cures for abortion of all kinds, sterility, and all other cow diseases, he would soon realize why infectious abortion is spreading so rapidly over our country and causing such terrible losses in the cattle industry. However, the number of those fake and quack remedies correspond favorably to the number of panacea chicken medicines sold—in Kansas alone in 1924 there were 156 different panaceas for chicken diseases of which 56 different remedies were cures for roup.

Sterility and infectious abortion can be as successfully treated and controlled as most of the other diseases, by local veterinarians in the field of actual practice. The local veterinarians are in position to personally study the existing conditions, make physical examinations, obtain blood for serological tests, remove retained afterbirths, treat the metritis, observe and care for other conditions that may be present or apt to arise later. But none of these conditions or diseases can be treated successfully by mail or long distance telephone.

If infectious abortion is found to be present in a herd, it is advisable to treat the entire herd, including the bull. Existing conditions and unusual things that arise as complications, must be cared for and treated as they appear, and, with all due respect, no dairyman or herdsman, regardless of how well educated he may be, has the knowledge of medicine, bacterins, serums, vaccines, toxins, anaphylaxis, immunity, anatomy, physiology or infectious diseases to be encouraged by any one to attempt to diagnose and treat infectious abortion and sterility. However, from what they have learned from fake and quack literature, they have tried to apply all remedies recommended and usually the grafter is the sole beneficiary, as most all cows so treated are sacrificed upon the public markets and are then lost from observation and record.

A report of one herd at this time is

worthy, as it explains partly the situation where fake and quack remedies are used. In this herd were 32 purebred cattle of great value which a layman had attempted to treat. Of the 32 animals, 46 per cent have atresia of the vagina, 17 per cent became pregnant after one year. Each has a severely constricted vagina and will apparently have great difficulty at calving time. Of the 15 remaining animals 45 per cent are known to be pregnant. This instance affords advice given to laymen who, however intelligent and sincere fail in their application. This condition is a serious one but I feel sure that every practicing veterinarian who does sterility practice meets with similar and just as destructive conditions.

One other case report will not go amiss, as I feel sure every practitioner meets with exactly or similar cases. A client of mine, "as I was out of town," called another veterinarian to remove an afterbirth from a Holstein cow. The next evening I was called to see the same cow, and found her suffering, seemingly, from afterbirth labor pains and I proceeded to examine the cow and found the afterbirth all removed and the uterus in fair condition but did find a terrible inflammation of the mucous membrane of the vagina. Upon inquiry I learned that the owner and a neighbor had read in some bulletin that irrigation with a salt solution was indicated and recommended in such cases and they proceeded to practice what they had read, with the result, that it became expensive to the owner to save the cow's life and upon recovery she has a severe constriction of the vagina.

I believe that our Bureau of Animal Industry and the experiment stations throughout the country could do at the present time no greater service to the cattle industry and no greater work in controlling infectious abortion and sterility than to start a campaign of education, first to teach the dairymen and cattle breeder that infectious abortion and sterility are dangerous diseases to fool with and to buy and breed no animals unless known to be free from infectious abortion, and that fake and quack remedies are of little or no value, and such remedies if not inert may prove to be dangerous and disastrous. Second, that influence should be used to enact and enforce laws to prevent fake and quack remedies from being sold, and also to prevent such literature, advertising such remedies, from being sent through the United States mail. In other words, let the government license all who would sell, and let the government be responsible for the curative properties of all such remedial agents placed on the market.

In conclusion I shall sum up in a brief general way, the usual methods of treatment in sterility. A correct diagnosis of the cause must be made first, then treated accordingly. If infectious abortion is found to be present it should be treated as any other infectious disease, that is, along scientific methods that are known to give best results.

As yet science has not given us a satisfactory immunizing agent. Therefore, immunity against infectious abortion has not been satisfactorily accomplished. But it is hoped that some one will be fortunate enough to soon discover a positive immunization agent that will prevent the disease.

Fairly good results can be obtained in treating infectious abortion and most cases of sterility, if strict scientific methods are applied constantly until the disease is under control. But to cease such efforts after a few months' treatment frequently proves a waste of time and money. Therefore, a close observation and a continuous vigilance are required for a period of from one to two years and in some herds of unusual virulent infection a longer period of time is required.

Best results are attained by the use of bacterinization, vaccination, the administration of vitamins and mineral matters, sanitation and isolation, coupled with treatment of complications.

Bacterinize all cattle in the herd with not less than a three-dose treatment. Rebacterinize all cattle in the herd at the end of sixty days following the first treatment. Isolate all cows that have a vaginal discharge. If abortions occur the aborters should be isolated from the herd for at least sixty days. Continue to rebacterinize every ninety days until all abortions have ceased. For vitamin and minerals I prefer Vitamineral, administered in the feed from the beginning of

treatment until abortions have ceased. In all cows that are thin in flesh, increase the amount of feed and minerals. In all cows that are overfat, remove the concentrated feed, let them rough it, and administer minerals on the hay, ensilage and fodder. I believe that cows that have infectious abortion at that time or soon afterward, become low in vitamins and mineral matters, regardless of the amount of flesh they may possess, and the normal amount of these elements should be restored as soon as possible to the animal's body.

All other conditions, which are usually many, must be cared for at the proper time, and satisfactory results are sure to follow.

The treatment and care that I have outlined or other methods which I have only mentioned are good. None are panacea. But as large a percentage of successful treatments may be obtained as from treating other infectious diseases. However, it is a long drawn out and tedious task and is usually expensive. But vigilance and expense must be endured until such time as cattle can be immunized against infectious abortion. But now treatment is decidedly cheaper (the cost is only a "drop in the bucket" to the dairy cattle owner), than the loss of milk alone, or the loss of one crop of calves to the beef cattle owner, not considering the loss sustained by the owner in sending good cows to slaughter.

Proper education and proper treatment of infected herds would mean the conservation of many good and valuable cows to the cattle industry.

STUDY OF UDDER CAPACITY

The udders of two cows killed at the Federal dairy experiment farm, Beltsville, Md., were removed immediately after slaughter and mounted in a position for post-mortem milking in a recent test to determine whether milk is manufactured during the few minutes required for the milking process, as is generally taught, or whether it is secreted continuously and collected in the udder previous to milking.

It is quite generally held that the capacity of a cow's udder is not more than a half pint to each quarter and, therefore, that the milk must necessarily be manufactured during the milking operation. In these tests it was found, however, that a cow's udder is capable of holding from 11 to 20 quarts of milk. One of the cows had normally been giving about 12 pounds at a milking. When her udder was milked after being completely severed from all body connections a total of 10.27 pounds of milk was obtained, or more than 85 per cent of her normal production, indicating that this amount had been collected and stored as milk previous to her slaughter. The post-mortem milking of the second cow yielded practically 50 per cent of her normal production. A considerable quantity of milk still remained due to the difficulty with which it was released.

In the opinion of W. W. Swett, Bureau of Dairy Industry, United States Department of Agriculture, these tests indicate that milk secretion is to a considerable extent a continuous process, and that a large proportion of the milk secured at any milking is collected and stored within the mammary gland before milking is commenced; also that the liberation of the milk from the gland is not dependent either upon a nervous or mechanical stimulation or upon internal muscular contraction.

Extensive studies of the mammary gland are now being made by the bureau in connection with the project dealing with the relation of a dairy cow's conformation and anatomy to her milk and butterfat-producing capacity. This newest phase in the study of the mechanism of the dairy cow promises to be most interesting and highly productive of valuable information.

Loss of Pigs Due to Infectious Rhinitis (Bull Nose)

A. T. KINSLEY, Kansas City, Mo.

BULL NOSE is probably infectious and is characterized by inflammation of the mucosa of the nasal chambers and related sinuses and by involvement and deformity of the facial bones. Although this condition is similar to nasal catarrh it is more severe and destructive. Bull nose or sniffles is quite prevalent and is responsible for the loss of many pigs in various locations each year.

As a rule, when bull nose first appears on a farm, only a few pigs become affected, but each succeeding year the percentage of infected pigs increases and by the fourth or fifth year after the disease first occurs it is not unusual for twenty-five to forty per cent. of the pigs to become affected. The increase of the disease from year to year is indicative of an infectious cause of this malady. It has been noted that bull nose is more common in pigs that are kept in pens and lots that have been used for swine for several consecutive years.

This malady is more prevalent in herds in which no new breeding stock has been introduced for several generations. Bull nose may occur in swine on a farm where this disease had not previously existed after the introduction of apparently healthy pigs from a farm where the disease did exist. It may also develop in healthy pigs, taken from a farm where there was no bull nose, and yarded in lots where cases of this disease had previously existed.

Cause

Filthy pens, improperly ventilated hog houses, the continuous use of the same lots and sheds, and inbreeding are factors that predispose to bull nose. The occurrence of this malady in a herd soon after the introduction of pigs from a diseased herd, and also the development of the disease in pigs from a healthy herd that are confined in lots that had been previously occupied by affected pigs indicates that the malady is of an infectious nature, that apparently healthy pigs may be carriers, and that the infection persists on the premises. The B. pyocyaneus can be demonstrated in the nasal discharge and lesions of a large percentage of cases of bull nose and may be the specific cause. This microorganism is quite widespread occurring in soil, manure heaps, and stagnant water.

Symptoms

Sneezing or blowing is usually the first evidence of this malady, hence the name sniffles. There is usually an acute nasal catarrh manifested by a watery discharge in the beginning which later becomes purulent or mucopurulent. The affected swine have a tendency to root. They eat very little, consequently they do not gain in weight and they soon become gaunt and unthrifty. There is usually a conjunctivitis characterized by a purulent discharge and adhesion of the eyelids. In the latter stages there will be bulging of the facial bones, thus producing deformity of varying degrees. The snout may be turned upward or sidewise. The involvement of the nasal mucosa and the facial bones interferes with respiration which is usually associated with a peculiar blowing noise.

The length of duration of bull nose is variable. The disease is relatively short in those cases in which there is a marked toxemia due to the absorption of the bacterial products. If the disease remains localized the affected pig may live for a year or even longer.

Lesions

Pigs affected with bull nose are usually unthrifty, emaciated and small for their age.

Acute catarrhal inflammation of the nasal mucosa manifested by congestion and tumefaction characterizes the initial stages of bull nose. As the disease progresses the inflammatory process becomes purulent and there is usually a dirty gray, sticky exudate upon the mucosa. In some cases variable sized areas of the mucosa become necrotic and the underlying osseous tissue is invaded and becomes cancellated and tumefied thus producing the bulging of the facial bones and the sequential deformity. The hard palate may be forced downward, diminishing the oral cavity.

The inflammatory and necrotic processes extend from the nasal mucosa and involve the mucous membrane of the various facial sinuses and the conjunctiva is usually similarly affected. There may be metastasis of the purulent processes evidenced by abscess formation particularly in related lymph nodes.

Diagnosis

Bull nose may be confounded with necrotic stomatitis. Bull nose is essentially a chronic malady and the lesions are without odor. Necrotic stomatitis is acute and is characterized by an intense inflammation of the buccal mucosa, in which the inflamed membranes pass through the successive changes of congestion, tumefaction, necrosis and erosion, and the affected tissue has a peculiar disagreeable, pungent odor.

Treatment

The value of curative treatment is doubtful excepting in the very early stages when medication by inhalation of such agents as oil of eucalyptus or tincture of iodin may be beneficial providing the patients can be properly confined in an air-tight chamber or in such a manner that they can be medicated with a vapor or steaming bag. Those cases in which there is bulging of the facial bones are practically hopeless and should be destroyed.

Bull nose is a preventable disease and the cost of instituting effective preventive measures is not prohibitive. Successful swine production is dependent upon better farm sanitation exemplified by rotation of pens, lots and pastures, and clean sleeping quarters. Filth is an enemy to health and normal development of swine. Sex hygiene must be given more consideration by the swine producer. Inbreeding and excessive use of the boar is conducive to the production of pigs of low vitality and therefore an increased susceptibility to various diseases. Improper feeding although not specifically subjecting pigs to sniffles is a predisposing influence.

Proper care and management of the breeding herd and the maintenance of sanitary surroundings will reduce pig losses due to bull nose to a minimum.

TUBERCULOSIS ERADICATION NOT COSTLY

At the meeting of the Eastern States Tuberculosis Conference at Burlington, Vt., June 22nd and 23rd, Dr. John R. Mohler, Chief of the Bureau of Animal Industry, stated:

"More than 9,000,000 cattle in 842,000 herds were tuberculin tested in the United States in the last twelve months. The total number of reactors was slightly under 3 per cent. In other words tuberculosis was found in the proportion of one-third of an animal in every herd tested. It is self-evident that it is more economical to sacrifice one-third of an animal per herd now than to allow the disease to spread until 50 per cent or more of the animals per herd become tuberculous, as is the case in some European countries. If by taking one-third of an animal now from every herd in this country tuberculosis can be eradicated, the expense will not bankrupt the livestock industry, nor will it be too much for the state and national governments to bear."

An Unusual Case of Echinococcus Cysts in the Liver of a Hog

J. S. **BENGSTON**, Assistant Veterinarian, Branch Pathological Laboratory, Chicago, Ill., Bureau of Animal Industry, United States Department of Agriculture

ECHINOCOCCUS cysts in the liver of swine are occasionally encountered in the packing houses in Chicago by the veterinarians on the federal meat inspection force. The percentage of hogs slaughtered in Chicago showing infection with echinococcus cysts is very low. While we have no definite figures, it is estimated that echinococcus cysts are found in about one hog in every 200,000 or 300,000 hogs slaughtered at this station.

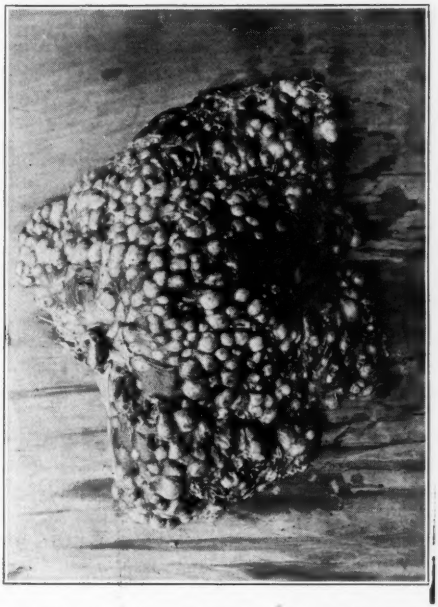
Echinococcus cysts may be found in any of the hogs slaughtered in Chicago, but they appear to be more prevalent in hogs shipped in from southern markets. The percentage of echinococcus cysts found in meat food animals should be in direct proportion to the number of dogs infested with Taenia echinococcus, or, as it is now called, the Echinococcus granulosus, on the farms where the animals were raised or fed.

Recently we received at this laboratory the liver and lungs of a hog infested with echinococcus cysts. The hog was reported to be a young animal weighing about 200 pounds. The parasitic infestation of the liver and lungs apparently did not materially affect the health of the animal, as it was reported to be in good condition.

The infested liver of the hog weighed 19½ pounds and contained many hundred of cysts, ranging in size from one-half to about one inch in diameter. The cysts were so numerous that the greater portion of the liver consisted of cysts, as the accompanying photograph shows.

The lungs of this same hog contained about 100 cysts which were somewhat smaller in size.

The majority of the cysts in the liver were of uniform size, about three-fourths of an inch in diameter, showing that the hog consumed the eggs that gave rise to this infestation at about the same time. If this were not true, there probably would have been a greater variation in the size of the cysts found in the liver.



Liver of swine infested with echinococcus cysts. Photograph by Mr. C. T. N. Marsh, Meat Inspection Laboratory, Chicago, Ill., Bureau of Animal Industry, U. S. Department of Agriculture.

Judging from the size of the cysts, we estimate that this hog had been infested with echinococcus cysts about 3½ to 4 months, as not all of the cysts contained heads of the adult parasite.

The life cycle of Echinococcus granulosus is briefly as follows: If a dog or

wolf eats portions of organs containing mature cysts, the heads of the parasite contained in the cysts will attach themselves to the mucous membrane of the intestine, and develop into adult tapeworms. Ripe segments containing eggs are probably detached from the parasite, and are expelled from the intestinal tract of the infested animal. Any of the mammals, including man, whose food or water is contaminated with these eggs, or who get these eggs into their digestive tract in any manner, may become infested with echinococcus cysts.

When the eggs reach the stomach of man or other mammal, the shells are destroyed by the gastric juices, and the six-hooked embryo, which is thus freed, bores its way through the intestinal wall and is probably carried by the blood stream to various parts of the body, where it becomes encysted and develops into the large cyst as seen in the photograph.

Organs infested with echinococcus cysts, even though they are mature and contain the heads of Echinococcus granulosus, are not harmful to man, because the parasite is not transmitted to man in this manner. As shown above, it only reaches maturity in the intestines of such animals as dogs, wolves and coyotes. For this reason dogs should not be allowed to consume offal promiscuously from slaughtered animals.

The adult tapeworm, Echinococcus granulosus, is the smallest tapeworm found in the domestic animals. It consists of a head and three segments and is only 4—5 m. m. (one-fifth inch) in length. Owing to its very small size, it may be easily overlooked unless one has this parasite in mind when examining the intestinal mucous membrane of dogs.

The object of this report is merely to call attention to the unusual size of the liver in this particular animal, although livers of hogs infested with echinococcus cysts which were much larger are reported in the literature.

HOGS COOLED WITH 60 CENTS' WORTH OF ICE

During the hot weather of early July a representative of the Packers and Stockyards Administration, United States Department of Agriculture, checked off a train load of stock as it arrived in Chicago to see whether or not any of the cars of hogs had been protected against the extreme heat.

"I found one car of protected hogs," he reports, "which was loaded at 5 p. m. on Wednesday and unloaded on the Chicago market at 8:30 a. m., Thursday. Suspended from the roof of this car were four gunny sacks containing ice. Each had been filled when the car left Beloit, Wis., and the 150 pounds of ice cost but 60 cents. The owner, who accompanied this load of hogs, stated that he ships between 600 and 700 hogs each year and that all hogs shipped during the summer months are taken care of as these were. Every hog that walked out from the car seemed cool, although the temperature in Chicago at the time of unloading was 90 deg. F. So far as I have observed, this is the first load of hogs coming to the Chicago market this season which was protected from the heat by suspending ice packs from the car roof."

It was the opinion of this shipper that bags of ice make a car from 10 to 15 degrees cooler. Cool air descends, circulates over the backs of the hogs, and keeps them cool. This method has long been urged by the department as a profitable practice in shipping hogs.

"Sows generally contract infectious abortion from each other rather than from other species of animals such as cows, ewes, or mares. This practically eliminates the possibility of swine becoming infected from drinking the milk of aborting cows or of acquiring the disease from other live stock. The infection is usually introduced into a clean herd by purchase of infected swine." —Hadley and Beach.

Some Swine Problems

A. T. KINSLEY, Kansas City, Mo.

No. 1

INFORMATION relative to cause and treatment of the following described condition in a herd of swine will be appreciated.

The disease in question has thus far been confined to cholera-immune mature brood sows that were ranging in a sweet clover pasture. All affected sows had suckling pigs. The first symptoms noted consisted of a tumefaction in the cervical or pectoral region. There was disturbance in locomotion similar to lameness due to muscular rheumatism. Lameness becomes more pronounced as the disease progresses and there is, in most cases, some incoordination. The appetite is normal in the beginning, but within 24 to 36 hours after the onset affected individuals refuse feed and water. The temperature ranges from 101° to 103° F. Two have died and three others are affected.

The tumefied areas contain varying quantities of coagulated blood. The odor from the tumefied areas was similar to the odor that characterizes blackleg tumefactions. There was more or less congestion and hemorrhages in the heart, lungs, stomach, intestines, kidneys, bladder and lymph glands. None of the suckling pigs have showed evidence of the disease; even those that lost their dams still remain healthy.

Is the condition hemorrhagic septicemia or other infection, or is this disorder the result of consuming sweet clover?

A free discussion by readers of Veterinary Medicine will be appreciated.

No. 2

On June 24th, 131 spring pigs that were kept in a sweet clover pasture were treated with serum and virus. There were 133 pigs in this lot but two runts were destroyed prior to vaccination. All pigs were coughing more or less when vaccinated.

The owner reported seven dead pigs on June 30th, that is, six days after vaccination and the following conditions were reported July 7th, by the attending veterinarian. Several pigs were coughing, thumping, sneezing, also evidenced conjunctivitis and had a temperature up to 106.7° F. Three pigs were destroyed and carefully autopsied with the following findings: slight hemorrhages of the epiglottis, heart, lung and one punctiform hemorrhage in each kidney. Extensive congestion in anterior lobe of lung. Slight infestation with lung worms and ascarids. Spleen slightly enlarged and friable. Large "button" ulcer at ileo-cecal valve, and several small ulcers in mucosa of large intestine.

Of the 131 that were vaccinated, fourteen have died, including three destroyed for autopsy. These pigs were taken off the sweet clover pasture when they began to sicken and have been receiving a ration of buttermilk from a nearby creamery and a small quantity of corn.

The same serial serum and virus were used on other swine with splendid results. Is this a cholera break, or were the lesions found due to vaccination? How long standing was the enteritis in the pigs autopsied as reported above? What is the significance of the conjunctivitis? Did the sweet clover have anything to do with this outbreak? How should herds showing the above symptoms and lesions be treated?

The above is like many others that are received from time to time and the readers of Veterinary Medicine will appreciate a discussion from practitioners in different sections of the country.

Bronchoscopy in Lung Conditions of the Dog and Cat

J. G. HORNING, D. V. M., and A. J. McKEE, D. V. M., Houston, Texas

IN OUR last article on endoscopy published in Veterinary Medicine, January, 1926, we suggested that the greatest field for this work was in treating diseased conditions of the lungs. In selected cases of lung suppuration, bronchoscopy is a valuable adjunct, whether the suppuration is a pyogenic infection reaching the lung by way of the air passages, blood, lymphatics, and extension from contiguous structures, acute or chronic, single or multiple, circumscribed

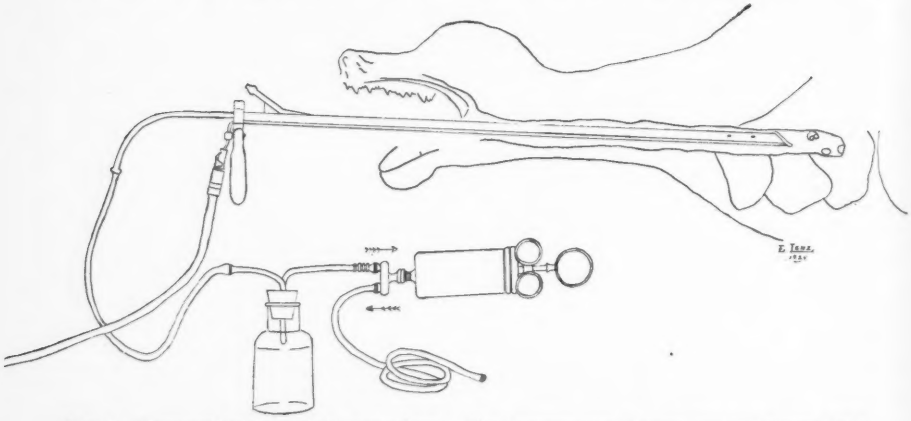


Fig. 1. Removal of bronchial secretions. The instruments shown are a Lukens-Jackson aspirating and irrigating bronchoscope with aspirating tube in position to which is attached a portable aspirating outfit.

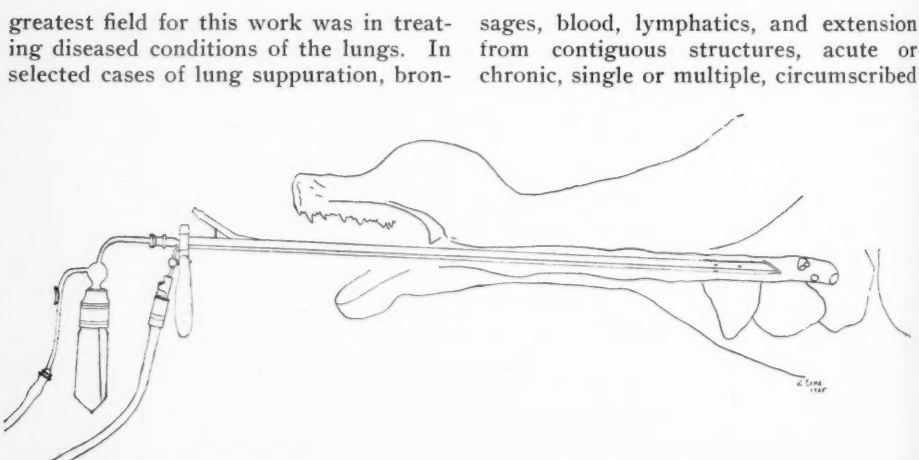


Fig. 2. Placement of the instrument with the Louis H. Clerf's bronchoscopic atomizer attached.

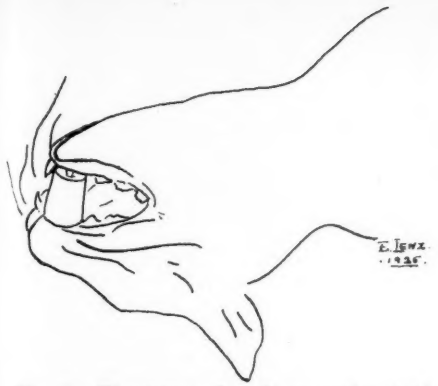


Fig. 3. Placement of cork on canine teeth to hold the mouth open.

or diffuse, or involving one or more lobes. When near the surface pleurisy may develop.

By the use of pneumography a more accurate determination regarding the location and extent of the process is possible, which will often be of great assistance in deciding the proper treatment. By pneumography we mean the use of an agent which is opaque to the Roentgen ray, is capable of being introduced into the air passages and when so introduced will prove harmless to the patient, and will thus serve the purpose of lung mapping or pneumography.

In any condition where there is an excess of tracheo-bronchial secretion bronchoscopy is indicated. Our method here is to give the patient 1/6 grain of morphin to every pound of body weight, introduce the bronchoscope as recommended in our previous articles, aspirate the fluid as in Fig. 1, then spraying with a Clerf's atomizer as indicated in Fig. 2. We use the Horning bite block in dogs, and the cork in cats as illustrated in Fig. 3. In spraying we use a solution of gomenol and mineral oil. For thinning abundant tenacious pus in the suppurative lung cases, especially in abscess cases in which the cavity is hard to reach by the aspirating tube, irrigation with a Lukens' thermic irrigator is carried out. Care must be taken to block off the draining bronchus with the mouth of the bron-

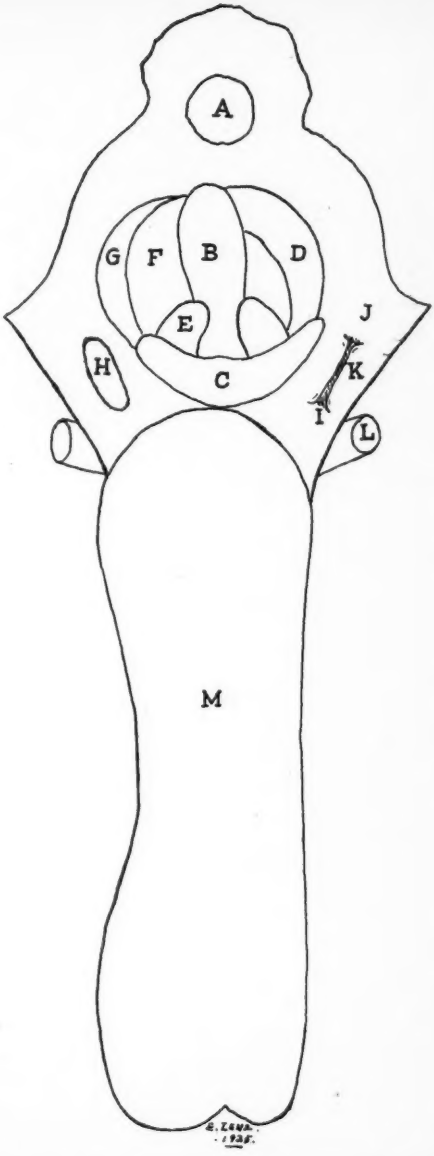


Fig. 4. Dorsal aspect of the tongue, larynx and esophagus. A, lumen of the esophagus cut off just as it opens into the pharynx; B, the glottis; C, epiglottis; D, crico-epiglottic ligament; E, true vocal cords; False vocal cords; G, arytenoid cartilage; H, tonsil exposed; I, anterior pillar of the fauces; J, posterior pillar of the fauces; K, tonsilar groove, closed; L, hyoid bone cut off; M, tongue.

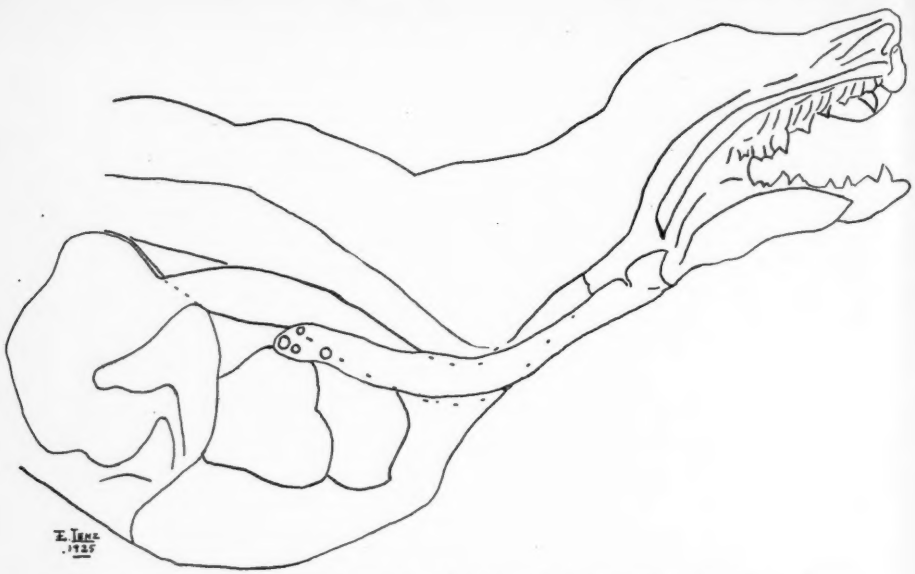


Fig. 5. Sagittal section, median line, left half of dog, exposing the tongue, larynx, pharynx, esophagus, stomach, trachea, bronchus and lobes of the lungs.

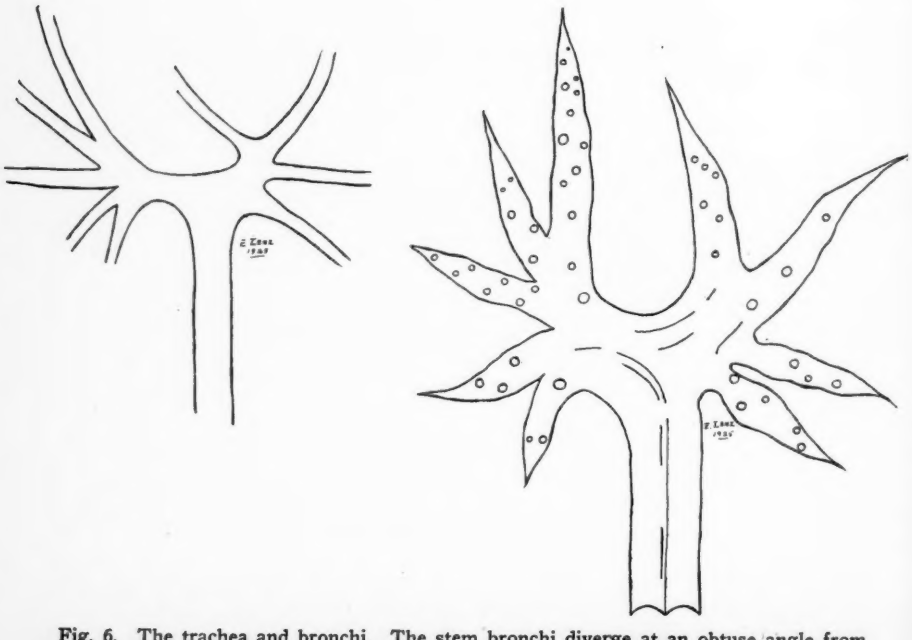


Fig. 6. The trachea and bronchi. The stem bronchi diverge at an obtuse angle from the trachea, each dividing into two branches before entering the lungs.

choscope so that the healthy lung tissue is not flooded, thereby spreading the infection. The ingoing solution should be drawn off as fast as it enters to prevent flooding.

Believing it will be advantageous to recall the anatomy of the parts, we invite a review of same in Figures 4, 5, 6, and 7.

The suggested technic and treatment by bronchoscopy will be found of excellent service in selected cases in the dog and cat.

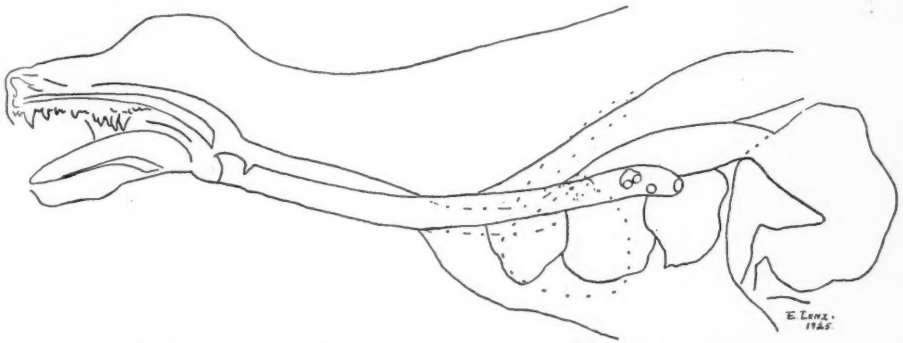


Fig. 7. Sagittal section, median line, right half of dog. The marking — . — . shows the esophagus turning down under and slightly to the side of the trachea. The marking . . . . . shows the position of the heart and its relation to the parts involved.

FARM DOGS OF VALUE

The farm dog receives but little recognition from statisticians. In the consideration of the animal population of the country, the dog is oftentimes not even mentioned. From reliable figures, however, it appears that the money value of the dogs in the United States runs not far from a hundred million dollars.

From the standpoint of the dog breeder, professional courser, or sometimes from a purely sentimental standopint, the valuation placed upon dogs is considerably inflated. Yet in many instances these values are real, because of the incomes they are able to earn for their owners. In the past, farm dogs have been quite largely of mongrel type, but in recent years there has been a growing tendency toward pure bred dogs, as in other lines of farm animals. The pure bred dog may in fact prove to be a very valuable animal because of the pedigreed breeding stock which can be sold at good prices. At the same time such dogs may be earning their keep in helping in the care of stock, destruction of rodents, snakes and other pests, in guarding the property of their owners and in providing wholesome companionship to all members of the family. The influence of animal companions upon the life and ideals of a growing boy cannot be measured. The long tiresome trips after cattle or horses, the herding of stock away from fields of grain, and the protection given to property by the mere presence of a watchful dog are duties which many overlook and few can properly evaluate.

A farm dog may prove an almost invaluable asset to his owner if properly trained, properly treated and cared for, and especially if his breeding is such as to add directly to the farmer's income. R. F. Bourne, Department of Veterinary Medicine, C. A. C., in the Palisades (Colo.) Tribune, Aug. 6.

Nutritional Problems in the Feeding of Young Animals*

PROF. F. B. MORRISON, University of Wisconsin

FIRST of all, I like to look at farm animals as living machines, as machines for converting the products of the field into products that are of some particular use to us, no matter whether it is milk, wool, meat, or work of horses. Looking at animals that way emphasizes that in order to secure efficient production from them, they must secure in their food the right kind of raw material, a thing that all manufacturers appreciate. Even Ford cannot make an automobile unless he has exactly the right kind of raw material, but it is an item that many farmers do not appreciate.

Away back in 1864, Wolff, a German chemist, appreciated this fact fully and got out feeding standards. Today we have adopted into our common life the telephone, telegraph, the automobile, and still more recently the radio, and all these modern inventions. Yet many farmers who have these modern improvements in their homes do not appreciate the necessity of efficient feeding if they expect to secure maximum profits.

What are balanced rations? Reduced to the simplest terms, all that we can mean by balanced rations today is just about this simple fact: That proper amount of protein.

In any set of feeding standards, I do not believe we will be able to express in definite numerical amounts any other factor than the proper proportion of protein to other nutrients. In other words, I do not believe, at least for many, many years, and perhaps never, can we take such factors as mineral matter and vitamins into consideration in any set of feeding standards.

* From Proceedings of the Twenty-ninth Annual Meeting of the U. S. Live Stock Sanitary Association, held at Chicago, Dec. 2-4, 1925.

Proper Amount of Protein Needed

There is a danger on the part of many people at the present time, on account of the great popular interest in some of the new discoveries in nutrition, to ignore the fundamental fact with reference to the need of an adequate supply of protein in rations. Many men get to thinking that vitamins and mineral matter are more important than anything else. That is not so. For efficient production, you must have all the necessary factors. We cannot get away from the fundamental fact, appreciated way back in 1864, that for adequate and economical production we must have the right amount of protein in the rations of live stock.

Of what importance is this fact in feeding young animals? It is of vital importance, simply because young animals making muscle tissue and other protein tissue of the body very rapidly naturally require much more protein than older animals.

This fact is often disregarded, not only by farmers but by experiment station workers. Many trials have been carried on, for instance, in feeding swine, in which they have been fed by experiment station workers a standard proportion of 10 per cent. tankage and 90 per cent. corn, starting at a young age and keeping on until they reach market weight. That is all wrong. The men who have carried on experiments of that type have disregarded the fundamental fact that a young animal requires very much larger percentages of protein than the same animal when it is half grown, and still more in comparison with the same animal when approaching maturity.

For example, you probably all know what a nutritive ratio means—simply the proportion of protein to other nutrients. Young

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pigs at weaning time should have a nutritive ratio, according to our best information, of about one to four or four and a half; that means one pound of digestible crude protein to four or four and a half of other nutrients. Reduced to a percentage basis, that means about 25 per cent of digestible crude protein in the ration. As they get older, they need less and less. For instance, a pig weighing 250 pounds needs only one pound of protein to every 6.7 up to even 7.5 pounds of other nutrients. In other words, he can get along on a nutritive ratio of one to seven and a half, entirely different from a pig right after weaning time. That is a fact of vital importance.

Translate that into terms of common feeds and what does it mean? An old idea is that a pig needs about three pounds of skim milk to every pound of corn he eats when he is not on pasture. That is all right for a certain weight of pig and radically wrong for other ages. At weaning time a pig should get from four to six pounds of skim milk to every pound of corn. When a pig has reached 200 pounds in weight, all he needs is from one pound to one and a half pounds of skim milk to one pound of corn.

If a farmer does not appreciate these facts, he may be under-feeding the young pig and supplying the older pig with much more skim milk than he needs. Right here I may state in feeding swine if a farmer has plenty of skim milk or buttermilk for his pigs, there is no necessity whatsoever of purchasing meat meal or tankage to balance the ration because he already has enough very efficient protein.

With reference to corn and tankage, what is the situation? A pig should have 14 to 15 per cent of tankage and the rest of the ration corn just after weaning time; on the other hand, 9 to 10 per cent of tankage is plenty for a 100 to 150-pound pig, a radical difference in the requirements, depending on the age of the animal. I might mention that under pasture conditions it is a little difficult to make hard and fast recommendations, but, there, approximately, a pig needs about half as much of the protein-rich supplement as he does under dry lot conditions, providing the pasture is good, efficient pasture, such as legumes or oats and peas or rape.

Under certain conditions, when protein-rich feeds are cheaper than those rich in carbohydrates, it is most economical to feed more protein than recommended in the feeding standards. An animal can stand a certain excess protein without any harm whatsoever. We have entirely given up the theory that men get gout and rheumatism because they eat a reasonable amount of meat. It is the same with an animal.

Under conditions where protein-rich feeds are cheap, such as in the alfalfa districts of the West or the cotton belt, oftentimes it is most economical to supply considerable excess of protein simply because it makes a cheap ration, though the animal does not need that excess.

Under conditions in the corn belt, on the other hand, our protein-rich feeds are commonly expensive and, therefore, we should try to feed just enough to balance the ration. A common recommendation for fattening two-year-old steers is to give them two and a half to three pounds of cottonseed meal per thousand pounds live weight daily. In other words, a steer weighing a thousand pounds should have from two and a half to three pounds a day, along with shelled corn, corn silage and what clover hay he will eat. As a matter of fact, steers do not need that much cottonseed meal. You can reduce the amount about 50 per cent, say about one and three-quarters pounds per thousand pounds live weight is enough for a two-year-old steer.

Quality of Protein as Important as Amount

Dismissing this question of amount of protein, next I wish to speak about the importance of quality or kind of protein. Robert Burns said, "A man's a man, for a' that, and a' that." Good poetry but mighty poor common sense, is it not? Proteins differ in quality just like men differ in capabilities.

Experiments that have been carried on at various places, for instance, experiments that have been carried on by Prof. Hart and his associates at our institution, show that

very clearly. In these trials, pigs have been fed various rations in cages where all the feces and urine could be carefully collected and then analyzed. On corn, these pigs could turn into pig meat only about 23 per cent of the entire protein in the corn grain. On the other hand, on skim milk the efficiency was 66 per cent—a radical difference.

Linseed meal is a highly efficient feed when fed right, yet in these trials when linseed meal was fed as the only kind of protein, the pig could store only 17 per cent of it in the form of muscle tissue and other protein tissue. When corn and linseed meal were mixed together, radically different results were secured. The efficiency of the mixture instead of being 23 per cent or 17 per cent, was increased to more than 30 per cent.

Still greater improvement resulted when corn was mixed with milk. Remember, corn has an efficiency of 23 per cent and milk over 60 per cent. If you mix milk and corn together in the right proportions, you increase the efficiency of the whole mixture to about the same efficiency as milk alone; in other words, over 60 per cent.

These scientific trials are of tremendous practical importance. We find the same thing holds true in extensive studies we have made of the value of various protein-rich supplements for swine feeding. I will mention some of these practical results later on.

These trials, as well as experiments carried on elsewhere, have shown that the quality of protein is of tremendous importance in feeding swine. A farmer cannot expect to get economical gains if he feeds inefficient proteins to his pigs; for instance, if he uses as the only supplement to corn or other grain any one of these supplements, or all of these mixed together—linseed meal, wheat middlings, corn gluten feed. All these proteins come from plant sources and do not supplement the deficiencies in the proteins of the grains. On the other hand, so far as the protein standpoint alone is concerned, soy-beans and peanuts furnish the best balanced proteins of plant sources that we have commonly available.

In poultry feeding, likewise, the quality of protein may make all the difference between success and failure, as practically all of you men know. We cannot expect efficient production from hens unless some source of animal protein is included in the ration or unless special care is taken to balance the protein quality as well as the amount, perhaps by the use of soy bean oil meal or soy beans or some other highly efficient protein of plant source.

Investigations have shown that the efficiency of a ration, so far as protein is concerned, depends on having present in it a sufficient supply of all the essential animo acids. If but one of the necessary animo acids is inadequate in amount, the ration will be inefficient. It will then be radically improved by adding some feed that supplies an abundance of the lacking building stone. Animal proteins such as are furnished by skim milk, tankage, and fish meal are especially good supplements to the cereal grains in feeding swine, due to the fact that they furnish plenty of the very animo acids which are contained in too small amounts in the grains.

With reference to feeding other classes of stock, the situation is different than in feeding swine or poultry. In feeding dairy cows, beef cattle, sheep and horses, if they are fed a decent sort of a ration—by that I mean legume hay and other good quality roughages—the quality of protein is not of primary importance. If a dairy cow is fed legume hay and corn silage, that roughage combination furnishes a protein of good quality, so that if a farmer is using corn as the grain with such roughage, he can use most any of the protein-rich feeds with good results. He can even use gluten feed, which is a corn by-product, and the alfalfa hay protein will supplement the deficiencies of the corn protein in gluten feed. I won't take the time to discuss that further, but simply wish to contrast the importance of quality of protein in feeding swine, especially young pigs, and in feeding poultry, with the fact that quality of protein is not of as much importance in other classes of live stock.

(To be continued)

Poisonous Plants

L. H. PAMMEL, Dept. of Botany, Iowa State College

RAYLESS GOLDENROD POISONOUS

RANCHERS of the west have suspected for some time that rayless goldenrod (Aplopappus heterophyllus), a plant of the sunflower family and related to goldenrod, is poisonous. The plant occurs in the Panhandle of Texas, New Mexico, Colorado, Arizona and to Northern Mexico. Dr. C. Dwight Marsh, Glenwood C. Roe and A. B. Clawson of the Bureau of Animal Industry, have published an interesting paper "Rayless Goldenrod (Aplopappus heterophyllus) as a poisonous plant," United States Department of Agriculture Bulletin No. 1391. The first records were sent to the Department from Dr. E. O. Wooten, that the plant was reported as poisonous and later reported that the consumption of the plant poisoned milk. There are several references to poisonous milk from the plant. Dr. F. L. Schneider and Kemper added further testimony to the poisonous qualities of the plant. Dr. Kemper stated the plant was known as "rocea" by the Mexicans, and the symptoms of poisoning resemble those of turpentine poisoning. Dr. Carter added a contribution, stating that the disease in Pecos Valley was what was called alkali poisoning. The authors referred to above carried on some extensive experiments, proving beyond a doubt that the plant is toxic. The summary of the work, as given by the authors, is as follows:

"A disease of cattle, commonly known as 'alkali disease' or 'milk sickness,' has long been known in the Pecos Valley of New Mexico and Texas. A disease of human beings commonly known as 'milk sickness' also occurs in the Pecos Valley, and has generally been identified with the disease of animals.

"The cause of this disease has been obscure. Some have thought it was produced by drinking alkali water; some have thought it due to a pathogenic organism; others have thought it caused by a poisonous plant, the rayless goldenrod (Aplopappus heterophyllus) being especially suspected.

"'Milk sickness' or 'trembles' has been known in the Central and Eastern States for more than a century. It has been shown, however, that most if not all cases of milk sickness in the East are caused by the plant Eupatorium urticoefolium, commonly known as white snakeroot.

"The experimental work detailed in this bulletin has shown that cattle, horses, and sheep, when given sufficient quantities of rayless goldenrod, develop all the typical symptoms of alkali disease or milk sickness. The toxic doses have been determined and the conditions under which poisoning is liable to take place have been discussed.

"It has been shown that the toxic substance may be excreted in milk, and that calves and lambs may be poisoned in this manner. It is probable that human cases of milk sickness arise from the consumption of milk or butter from cows feeding on the rayless goldenrod.

"It is shown that stock eat the rayless goldenrod only when confined in pastures where there is little good forage, so that the obvious remedy is to see that the animals are well fed. It is entirely practicable also to dig out the weed in fenced pastures."

The more detailed symptoms are described as follows:

"The first effect noticed in poisoned animals is marked depression. The animals are inactive, appear stupid sometimes, particularly in the cases of sheep, stand 'humped up,' and move with a more or less stiff gait. The stiffness and weakness are more pronounced in the forelegs. This inactivity gradually increases and culminates in extreme weakness, the animals in the later stages lying down most of the time, and eventually, in the more serious cases, being unable to rise. Constipation is present in most cases, but may be preceded or fol-

lowed by a period of diarrhea. In the later stages the feces are not only hard but bloody. The urine is generally very light in color, and the animals, when exercised, frequently have an almost continuous dribbling of the urine.

"The temperature remains practically normal during most of the illness, but in some fatal cases there was a marked fall shortly before death.

"The respiration in the sick animals a short time before death was very characteristic. It was labored, a prolonged inspiration being followed by a pause and then a short and somewhat forcible expiration. In still later stages the animal breathed in a series of gasps.

"Trembling is almost always present and may be considered a diagnostic symptom. This is recognized by the stockmen, who sometimes call the disease 'the trembles.' This varies from a slight twitching of the muscles, most commonly in the fore quarters, to a violent shaking of the whole body. These periods of trembling are brought on by exercise and are liable to continue until the animal gets down and has a period of rest. In some of the cases the breath of the animal had a distinct odor of acetone.

"Some of the animals kicked about a little before death, but did not have distinct spasms, and more frequently died without struggles. In some of the fatal cases the animals lay in a condition of coma for a considerable period before death."

BLACK NIGHTSHADE

Dr. H. C. Smith, of Fort Dodge, Iowa, writes as follows: "Under separate cover we are forwarding you a sample of a weed obtained from a pasture in which a large number of hogs were running. Several of them have sickened and died and the farmer suspects that this weed was causing the death of the pigs."

The specimen sent from Fort Dodge proved to be the black nightshade (Solanum nigrum), which has long been suspected of being poisonous, and cases of poisoning are not infrequent. The berries, however, are not poisonous, but it is the green plant that contains gluco-alkaloid which is poisonous. It contains colanin and solanidin, both of which have somewhat toxic properties. As stated before, the stubble berries or black nightshade when ripe has a black fruit, which is edible, but care should be used not to consume the green fruit because it is in the green parts of the plant that the poison resides.

It is said that the musky-odored plants are most poisonous. The symptoms of poisoning are stupefaction, staggering, cramps and sometimes convulsions. The pupil of the eye is somewhat dilated.

RATTLEBOX AND RUSSIAN THISTLE

Mr. L. G. Sorden, of Atlantic, Iowa, writes as follows: "I am sending under separate cover two weeds for identification. We think they are rattle box and Russian thistle, but are not sure."

The plants sent for identification proved to be as indicated in the letter, the Russian thistle and rattle box (Crotalaria sagittalis). The former, that is, the Russian thistle, is only injurious in a mechanical way in a dry condition when the plant is more or less spiny. The rattle box, on the other hand, is known positively to be poisonous.

The rattle box is a plant of the legume family which includes the local weed caliber bean, clover and pea. Rattle box is an annual from three inches to a foot high, more or less hairy with ovate or oblong lanceolate leaves with yellow flowers and a large, inflated, pea-like pod, which in a green seed resembles the garden pea. This plant is common in sandy soil, from Maine to Minnesota and South Dakota, and especially common on the sand bars of the Missouri River and then extends southeastwards into Iowa and Missouri.

Dr. M. Stalker many years ago described the disease as crotalism. It affects especially horses. Death is found to be not an uncommon occurrence. The progress of the disease is slow. Dr. Stalker states that there is a general decline of bodily vigor for a number of weeks or even months. The animal is emaciated. In many cases a marked coma or stupor was observed, the subject

often falling asleep while eating, and in some instances the animal loses consciousness.

The symptoms resemble some of those produced by consuming some of the western "loco weeds." Dr. Stalker made a number of experiments and proved conclusively that this rattle box weed is poisonous. Wherever this weed occurs the pastures should be cut and the weeds removed and burned.

CINQUEFOIL OR FIVE-FINGER AND VELVET WEED OR BUTTERPRINT

Dr. O. K. Simonsen, of Storm Lake, Iowa, sent the following letter with two specimens of plants:

"I am mailing samples of two plants taken from a hog pasture. I would appreciate your opinion as to whether or not either of these are poisonous to swine and if so what symptoms and lesions we might expect. The plant with the large leaves is the one more especially suspected.

"The owner has about 100 very thrifty 75-pound shoats running on alfalfa pasture. He has been losing about one a week for the last month. Some pigs that get sick die and some recover. The pig is off feed at first, but soon comes back on feed, but those that recover show a little gauntness for several days. There is a stilted gait and standing position similar to that noticed in hog cholera. Temperature of one pig that had been sick only 12 or 24 hours was 104 degrees F. (I am not sure that I remember this exactly.)

"Postmortem on one pig showed stomach and small intestines empty. The small intestines were sore, being edematous and containing considerable of what I would call a milky catarrhal exudate. Large intestines and contents apparently normal. There was a marked congestion of the lymph glands, especially those in the anterior part of the body and those of the intestines. This pig had not been sick long apparently and pigs that lived showed a marked diarrhea."

The plant with strawberry-like leaves is cinquefoil or five-finger (Potentilla monspeliensis), and so far as I know, has not been recorded as a poisonous plant.

The second plant with large leaves is velvet weed, butterprint (Abutilon theophrasti). This plant is a member of the Mallow family related to hollyhock, cheeses, malva, etc. It is naturalized from India, a common weed in many parts of the northern states. Stock generally avoid it because of the rather strong odor and objectionable flavor. It has, however, been reported as poisonous, but no symptoms were described with the supposed cases of poisoning. Therefore, it would be impossible for me to give the symptoms of poisoning.

In the September number of Veterinary Medicine I gave an account of poisoning from a species of Malva, namely, Malva borealis. The symptoms described there by Dr. Hester are as follows:

"The horse had its head down, legs braced, muscles all quivering, the respirations quick and shallow." Then he comments that this might easily have been mistaken for a case of acute indigestion.

The Mallow poisoning case is of interest because a related species is consumed by sheep without any ill effects, so far as I know.

I am glad to get this information about the supposed poisoning from this velvet weed.

WILD INDIGO

Mr. Carl W. Helbig, Center Point, Iowa, writes as follows: "I am sending a plant which I found growing in my pasture. I want to know the name (common) of it and whether or not it will affect my cows if they eat it. Is it of any particular value or just a weed? The plants remain about the same in number every year and do not seem to increase."

The plant is a species of wild or false indigo (Baptisia bracteata) which is a well-known plant of the leguminosae family. The flowers are white or cream color, the leaves are palmately compound and the pods are large, pointed at both ends and hoary. Plants belonging to the same genus, contain a toxin, principally baptitoxin, which is identical with cytisin and contains the glucoside baptisin.

There is no question of the poisonous nature of the plant. It produces weakness and weariness of the body, soreness and lameness of the eyeballs; the tongue is coated yellowish or yellowish-brown, causes nausea and there is a tendency toward delirium.

CHICORY AND BACHELOR'S BUTTON

Dr. F. A. Boies, of Logan, Iowa, writes as follows:

"Am sending under separate cover two varieties of plants. The one without many leaves on, not thick, but have been fed upon. The others were not fed on to any extent. Hill pasture without timber or brush. Very dry season and grass about all gone. Had one horse sick on the 23rd and is recovering from some kind of forage poisoning. Another horse fell in deep ditch same day but was not found until the 24th—dead. On the 26th another horse sick and will die. Subnormal temperature 99° F., pulse 70 weak, respiration, shallow and hurried, coma and pushing head into corners constantly. Prostrate at present. Lost one about six weeks ago on same farm and on P. M. diagnosed Hem. Sept. and vac. herd with H. S. Aggressin. Ten head. Cows in same pasture, but none affected. Took them out and placed on sweet clover. The pasture was mixed grasses, but chiefly all kinds of common weeds now."

Two plants were sent to me for identification. One is the common chicory (Cichorium intybus), which at one time was cultivated for its roots and used as a substitute for coffee. I do not think that this plant is strongly toxic, otherwise it would not have been used as it has been, as a substitute for coffee, and I do not recall any authenticated case of poisoning from this plant.

The second one is a species of bachelor's button (Centaurea) which is a recently introduced weed, belongs to the sunflower family, related to the bachelor's button of gardens (Centaurea cyanus) but so far as I know none of these plants are injurious. One or two specimens of Centaurea go by the name of knap-weed. These are chiefly injurious because of the spiny character and are quite troublesome in California and some other sections of the country. Dr. Boies states that the forage is extremely scarce and under these conditions, no doubt, many plants are consumed that otherwise would not be used by cattle and horses and a number of these are quite common in western Iowa and, no doubt, under certain conditions are consumed for food. One of these is the prostrate spurge (Euphorbia maculata), which is related to snow-on-the-mountain (Euphorbia marginata) which is also common in western Iowa and is known to be toxic.

Also, there are several species of milkweed, especially the whorled milkweed, which is known to be quite toxic. Then, too, there is some local weed in the western part of the state, particularly near the Missouri River, but I take it that probably the whorled milkweed would cause the poisoning referred to above, and I am sure Dr. Boies will find this plant.

IVY POISONING

Recently I have had a number of requests for information concerning what to do for poison ivy poisoning.

A great many people have tried the use of soap and water immediately after poisoning and the Science News prints the following:

"Dr. James B. McNair, of the University of Chicago, has carried out much investigation on the nature of the toxic principle in poison ivy (Rhus toxicodendron) and the chemicals which will render it harmless. His researches indicate that a number of iron salts are effective in this respect. A 5 per cent solution of ferric chlorid in 50 per cent alcohol is one of the lotions suggested, and a strong solution of iron sulphate in water is another."

Mr. McCubbin states that he finds the above excellent.

Mr. Herbert E. Rees, our custodian of the Lacey-Keosauqua Park, tells me that he

is very susceptible to poisoning and that he finds that the juice of jewel weed or touch-me-nots is very effective as a remedy for poison ivy poisoning.

ALSIKE CLOVER POISONOUS

Dr. J. Dunn, New Liskeard, Ontario, writes the following letter:

"I have previously consulted you on forage poisoning when practicing in Barrie, Ont., and as you will see, I am now practicing in New Liskeard, in the district of Temiskaming. This is what is termed New Ontario or Northern Ontario, and the clay belt here is a very fertile area and alsike clover seems to be a natural growth, almost to the stage of being a weed. There is considerable trouble with alsike poisoning. I think, if I remember right, you wrote an article on this in Veterinary Medicine. I cannot recall the date, and would be very pleased if you could give me any assistance in advising my clients."

The only experiments that have been conducted with alsike clover in recent times are those by Harcourt A. Morgan and Moses Jacobs (Bulletin of the Tennessee Agricultural Experiment Station, Vol. 18, December, 1905).

"The symptoms of this disease vary to some extent, depending upon the location of the lesions and the length of time the animal remains on the alsike pasture after the symptoms begin to develop. The cases which came under observation in Marshall County showed a marked similarity of symptoms, involving principally the skin, the mucous membrances of the mouth, and the eyes. The prevailing symptoms of this disease are as follows:

"On the skin are inflamed areas, appearing at first as more or less rounded vesicular swellings, varying from one-half inch to five or six inches, or more, in diameter. The hair over the affected areas stands erect, and has a dull appearance, indicating loss of vitality. Later the skin becomes hard and puffed out, as a result of the formation of pus underneath. Finally, the deadened skin is cast off, leaving a deep, raw, angry-looking ulcer, which eventually heals, with the formation of a conspicuous scar, covered with more or less white hair. These changes in the skin may occur on any part of the animal, but especially on the limbs, body and croup. The eye symptoms consist of a marked conjunctivitis, with swelling of the eyelids, sensitiveness to light, and a watery discharge from one or both eyes. The mucous membranes of the mouth become inflamed (stomatitis), ulcers form, and the animal slobbers, and refuses to eat. The advanced cases are frequently accompanied by emaciation. The tongue is usually affected, and the inflammation may extend throughout the entire digestive tract. The functions of the liver may be disturbed, and a yellowish (jaundice) coloration of the tissues follows. In such cases symptoms of colic are not uncommon, and the respiratory tract may become involved and pneumonia develop. Some observers in other countries have noticed marked nervous symptoms, such as excitement, convulsive movements, staggering gait, and paralysis of the throat, with inability to swallow, the paralysis at times becoming generalized, the animal getting down and being unable to rise. In the cases observed in this state, the nervous symptoms, except the general depression, were not very noticeable."

I also reported in Veterinary Medicine some years ago on cases that I observed in Webster County similar to the above.

ABORTION IN CATTLE

Dr. T. J. Cloffey, of Oconomowoc, Wisconsin, writes as follows:

"Have been reading your interesting write-up on poisonous plants in Veterinary Medicine. Are there any poisonous plants that will cause abortion in cattle? On two occasions in this neighborhood heifers were put to pasture and in the summer when pasture got short, abortion in almost the entire herd has taken place; when the remainder were moved to different pasture the trouble stopped at once with no further trouble."

With reference to abortion in cattle and other animals, I may state that in many pastures of Wisconsin several of the grasses

produce a large amount of ergot, particularly red top and timothy, also quack grass and occasionally blue grass. The other native plants on which ergot occurs, such as wild rye and Terrell grass, would not appear in the pastures. However, there is a very common weed in Wisconsin, known as tansy, which is an escape from gardens, that causes abortion. Cattle will not eat it when pastures are good, but when pastures are dry they might consume some of it.

FLOWERING SPURGE (EUPHORBIA COROLLATA)

Mr. Frank Breed, of the Jensen-Salsberry Laboratories, Inc., Kansas City, Missouri, writes as follows:

"We are sending under separate cover, a portion of a plant which we received from Ohio, for identification. This plant apparently caused a disturbance in horses, which caused the animals to go wild; the eyes were staring, profuse sweating along the back and shoulders; nostrils and lips twitching, head up and snorting. If animals are attempted to be led, they seem to have a tendency to jump over the person leading them.

"The animals were treated by means of stimulants and they were apparently recovering. This plant was found to be very prevalent in the hay.

"In attempting to look up this plant in your Manual of Poisonous Plants, I thought that it possibly belonged in the classification of Euphorbia, but not being much of a botanist, I did not dare to trust my judgment in the matter. I will appreciate it very much if you will give us an identification of the same."

The plant sent for identification is the flowering spurge (Euphorbia corollata) and is listed in my work, "Manual of Poisonous Plants," as poisonous. All of the spurges have some more or less toxic properties, some more than others. All of the spurges are more or less irritating in character, and some of the species like snow-on-the-mountain, when used on the skin, causes the hairs to drop out and in general is considered a more or less troublesome poisonous plant in the west. The eastern species have not generally been recognized as poisonous but many species of the genus were used by quack doctors to remove warts and freckles and the juice produces an erysipelatous inflammation. The general effect is very much the same as the effect from poison ivy.

Dr. Millsbaugh describes the poisoning from one of the species as follows:

"Brilliant, staring, wide-open eyes, dilated pupil; death-like pallor of the countenance, retching and vomiting; violent purgation, stools frequent, copious, and in some cases bloody; irregular pulse; whole body cold and rigid, followed by heat and perspiration."

YOUNG CHICKENS SPREAD "TB" TO HOGS

It is a general belief that chickens under 1 year of age seldom develop tuberculosis to the extent of becoming spreaders of the disease. Hence, it is thought that culling all birds above that age from the flock would soon eliminate the disease.

To determine whether or not this belief is well founded, Dr. T. S. Rich, of the United States Department of Agriculture, in charge of tuberculosis-eradication work in the State of Michigan, conducted a general culling campaign covering all poultry flocks in one township in the State. Every chicken on 151 farms was individually examined, or a total of 15,377. From this number 1,494 were removed as culls, and 86 were found upon post-mortem examination to be infected with tuberculosis. The disease was demonstrated to exist in about 38 per cent of the flocks examined. Three generalized cases were birds under 1 year of age. This was conclusive proof to Doctor Rich that young chickens as well as old are a source of danger in spreading tuberculosis to hogs and should be removed along with the rest of the flock when infection is discovered.

The X-Ray in Small Animal Practice

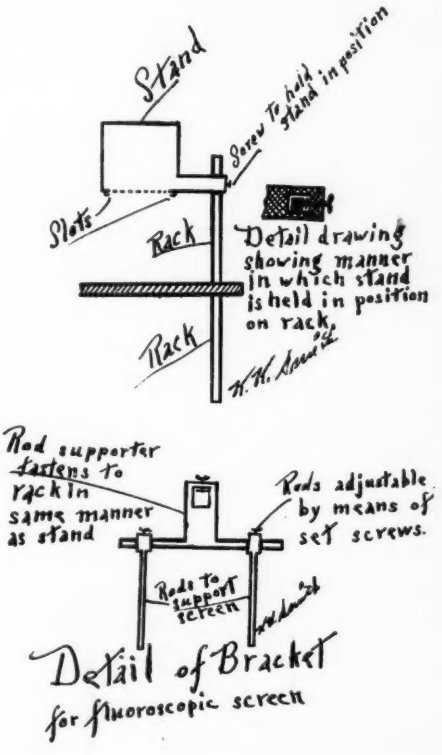
K. K. SMITH, X-Ray Technician, Horning-McKee Clinic, Houston, Texas

IN ORDER to keep these articles from becoming too lengthy, in each succeeding article as they appear, it will be assumed that the reader is familiar with the material which has been previously published.

Mention was made in the article just previous to this of the tube stand being used in two positions—one position being below the surface of the table and the other position being above the surface of the table, these positions being designed for fluoroscopic and skiagraphic work respectively.

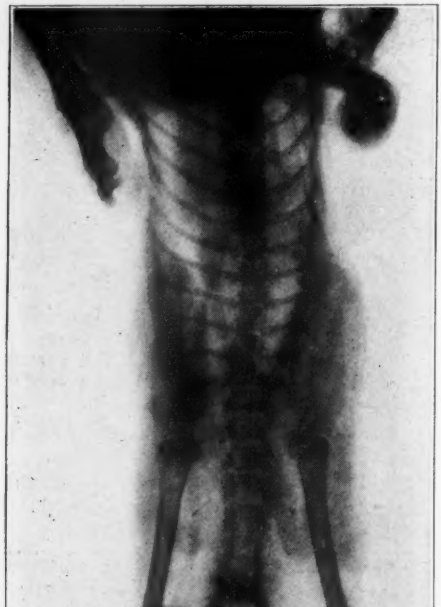
The tube stand as used in the Horning-McKee Clinic has been especially designed and fastened to the table which was described in the preceding article. This tube stand consists of the stand proper in which the tube is mounted and the rack for holding the stand in position. The stand is adjustable on the rack to enable the tube being raised or lowered as is required. The stand itself is a lead-lined box containing the tube and is constructed with proper provisions for the electrical connections. This box is of light construction and its sole purpose is with its lead lining to offer protection to the operator. The side opposite the active side of the tube is open and is fitted on each side of the opening with slots to accommodate the insertion of diaphragms of various sizes as may be needed. These slots will also permit the use of aluminum filters, of which more will be said in later articles.

While mentioning filters, however, it will be well to at least briefly describe their purpose. Filters offer to both the operator and the subject protection against the detrimental effect of the ray. Aluminum is of such light atomic weight that its use as a filter adds but little to the length of exposure (or amount of current) required. It must be borne in mind however that any object placed between the source of the ray and the plate (or fluoroscopic screen) will be in evidence. In this connection attention is invited to the two illustrations shown herewith. Both of these pictures are photographic reproductions of skiagraphs taken of a cat. This cat, to facilitate handling, was


Stand
Screw to hold stand in position
Slots
Rack
Detail drawing showing manner in which stand is held in position on rack.
Rack
Rod supporter fastens to rack in same manner as stand
Rods adjustable by means of set screws.
Rods to support screen
Detail of Bracket
for fluoroscopic screen

wrapped in a piece of heavy canvas cloth. Close examination will disclose not only this cloth but various folds in it, and the flesh of the animal can also be discerned in contrast to both the cloth and the bones. This is caused by the difference

in atomic weights of the different parts shown. It must be remembered that the illustrations here shown have been three times reproduced from the original skiagraphs. First, was the photographic reproduction from the original exposure on the film to the photographic print paper. Second, a photo-engraver's cut was made from the photographic print; and third and last is the reproduction from the cut to the printed page by the commercial printer. In each of these reproductions some of the more delicate details of the original are lost, and it is only by taking all of these facts into consideration that the difficulties of presenting clinical work on the printed page can be fully appreciated.



For work of a nature requiring more or less detail, resort should be made to the skiagraphic plate. More detail can be shown in the skiagraph than can be brought out on the fluoroscopic screen, and also the skiagraph may be studied thoroughly for any length of time and under the best of light conditions. By the use of proper filters practically all langer of burn is eliminated.

Fluoroscopic work is handled with much less current and unless the exposure is too prolonged the danger to the subject is greatly reduced. In this branch of the work the hooded fluoroscope has been almost entirely replaced by the fluoroscopic screen. There is but one advantage to the hooded fluoroscope—it is possible to use it in a lighted room. Its disadvantages are many, chief of which is the practical impossibility of the observer to keep out of the range of the penetrating rays. It is needless to comment upon the folly of the observer so exposing himself when it may be avoided.

As used in the Horning-McKee Clinic the rack fastened to the table for the purpose of holding the tube stand is in reality a dual rack consisting of one rack above the surface of the table and one rack below the surface. The tube stand is fastened in position on the rack above the surface of the table for skiagraphic work and on the rack below for fluoroscopic work. A special bracket has been provided to hold the fluoroscopic screen. This bracket is so constructed that it is fastened in position upon the same rack as is used for the tube stand. The bracket itself is adjustable to permit the use of screens of various sizes. The drawings shown give the details of this bracket.

In a later article photographs of this equipment in actual use will be shown.

THE CHICKEN TICK

The chicken tick, prevalent in some parts of the South, is a powerful blood-sucker. The earlier stages are passed entirely on the fowl's body, the tick not leaving the birds until it approaches maturity. The adult tick feeds only at night, after the fowls have gone to roost, and spends the day hiding in cracks in floors and walls.

To eradicate the ticks give the house a thorough cleaning, and spray it. Some of the best substances for the spraying are the so-called wood preservers which consist of anthracene oil and zinc chlorid. As a mixture of this kind is a little too heavy to spray well, it may be thinned with an equal part of kerosene. Crude petroleum is almost equally effective and usually cheaper. It should be thinned by adding 1 part of kerosene to 4 parts of crude oil. The birds should be kept out of the houses until the fluid has thoroughly soaked into the wood.

A good way to protect chickens from attack by ticks is to suspend the roosts from the ceiling by means of small wires. The roosts are prevented from swaying by similar wires between the roosts and the walls of the house. Nests should be located away from roosting places. If constructed of metal the nests can be disinfected quickly from time to time by burning out the straw.

When ticks have once been eradicated from the premises no chickens should be added to the flock until they have been quarantined for a period of 10 days in temporary coops. It is important that such coops be destroyed or disinfected with hot water.

A fatal disease in canary birds due to infection with a micro-organism belonging to the paratyphoid-enteritidis group occasionally occurs in bird stores. This condition is manifested by digestive disorders, constipation in the beginning followed by a severe diarrhea in which the droppings are of a greenish color.

ABORTUS INFECTION IN MAN

A case of infection in a white man, aged 33, with Brucella melitensis, variety abortus, is reported by E. E. Gage, M.D., and D. A. Gregory, M.D., of Sioux Falls, S. D., in the Journal of the American Medical Association, September 11th. The case was first seen March 20, 1924, and was observed for three months.

The patient complained of aching of the back and legs, chills, fever and sweats. He had been sick for three or four days, with gradual onset characterized by headache and malaise, and suffered from constipation. The blood count and urine were normal. His temperature ranged to 103°F., pulse to 100 maximum. He was discharged April 24th, improved, with normal temperature, but readmitted May 13th, with temperature 101.4°F. and pulse 100. While at home his headache, fever and sweats recurred. Laboratory tests identified the Brucella organism in the blood. On June 2nd he was given 0.22 Gm. mercurochrome-220 soluble intravenously. This was followed by a severe chill, vomiting, bloody diarrhea and a marked decrease in urinary output. He was given Fisher's solution intravenously with rapid recovery and left the hospital June 5th. He was afebrile at that time and has remained so since.

The following is quoted from the author's report:

"The bacteriology of the organisms causing Malta fever and infectious abortion of cattle has been extensively studied, especially by Evans, who has classified them into three main groups. Using forty strains, she showed that the majority of human, bovine, porcine, equine and caprine strains or organisms of the genus Brucella could be separated into three main groups.

"The majority of bovine and porcine strains fall into a group designated as Brucella melitensis, variety abortus. This includes the organism of infectious abortion of cattle, which was known as B. abortus (Bang).

"A second large group includes strains from human, caprine, bovine and equine origins and is designated as variety melitensis A.

"A third group, characterized by the occurrence of coccoid forms, is probably the variety that Bruce was working with when he discovered his Micrococcus melitensis. It is designated variety melitensis B.

"Type strains of Brucella melitensis, var. abortus, var. A and B, were obtained from the Hygenic Laboratory and absorption tests showed that the agglutinins of this patient's serum were absorbed for all varieties by the strain isolated and by the stock abortus strain, and only partially by the other two varieties.

"Investigation showed that this patient had worked only in the hog killing department for the past five years. This is probably the source of the infection, as Weeter showed that nongravid swine uteri may contain B abortus (Bang).

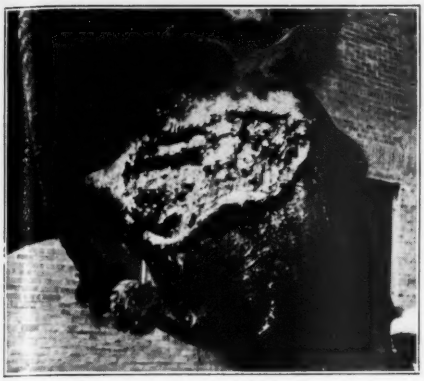
"Two cows that he was accustomed to milk were tested and did not show any agglutinins for Brucella melitensis in their blood. He was not in contact with goats.

"The symptoms of the case would confuse the diagnosis, as typhoid and tuberculosis were both suspected.

"The infectivity of the abortus strain must be low for human beings, as the disease is not uncommon in dairy herds and much unpasteurized milk is sold."

The mechanism of the maintenance of body temperature has never been satisfactorily explained. However, it is now thought by some physiologists that adrenalin and thyroxin, products of the adrenal and thyroid glands, are the essential factors in this important process.

Most veterinarians are familiar with vitamins, their source and value as an ingredient in feeds. Recently it was announced that there are products or substances designated "toxamins" that counteract or neutralize the value or effect of vitamins. Truly the biologic chemists are industrious.



The above illustrates an involvement of the parotid gland of a horse. This case was treated by Dr. W. B. Denham of Cumblerland, Iowa, and ultimately recovered, although the parotid gland was destroyed. The condition was caused by infection which may or may not have been the sequel of bruising or other mechanical injury. —A. T. K.

SWINE SANITATION

Lack of thoroughness in using the modern system of swine sanitation results in a corresponding decline in its effectiveness. This assertion by the United States Department of agriculture is based on the experience of 160 Indiana farmers, some of whom followed official directions completely while others, for comparison, used only parts of the system. The test was directed by Indiana extension workers with the following results:

Swine owners who cleaned farrowing pens before sows were put in raised an average of only 5.05 pigs per litter.

Owners who cleaned and also disinfected the farrowing pens raised an average of 5.67 pigs per litter.

Owners who cleaned and disinfected farrowing pens and also washed sows before putting them into the pens raised 6.85 pigs per litter.

Owners who followed all of the practices mentioned and in addition put their pigs on fresh pastures during the suckling period raised an average of 8 pigs per litter. The last method is the complete method.

It thus appears that any "cutting of corners" in using the system of swine sanitation reduces its effectiveness considerably. Department officials point out that the complete method, however, is simple and easily followed and urge that it be used in full.

CASTRATION ANOMALIES

During the castration season of 1909, I castrated a monorchid, two-year-old colt. The one testicle that he had was an abnormally large affair and was lobular or divided into several sections of testicular tissue. The colt made an uneventful recovery and showed no more signs of being a stallion, so I assumed that he had no more testicles.

In May, 1925, I castrated a monorchid boar, that is, I removed a normal testicle from the scrotum, and then assuming that there was another in the abdominal cavity, I proceeded to operate according to the Dr. George R. White method, but I failed to find another testicle. The patient was sewed up and in a short time recovered from the operation. He showed no more signs of being a "bo hog" either by actions or odor. Several months later he was fattened and killed for meat, the butcher being instructed to search among the intestines for the lost testicle, but none could be found. Therefore, I believe I am safe in assuming that there was only one testicle.

In May 1926 I castrated a big, husky, two-year-old colt that appeared to be normal in every way, but during the operation I found the tunic of one testicle so firmly adherent to the testicle that it could not be stripped away even by force. So I simply removed the tunic along with the testicle when I applied the emasculator, and the owner never knew that I had encountered anything out of the ordinary.

I mention these cases just as proof that they do exist and also as evidence that a fellow must not be surprised if he comes up against them. I have always been glad that it is not necessary for a veterinarian to tell all he knows, and if I were giving advice, I would suggest that if you cannot say something complimentary about your neighbor or brother practitioner, don't say anything.

Rembrandt Morgan.

Winfield, W. Va.

In this section of the country veterinary practice is interfered with because of the work done by federal veterinarians free of charge. Every farmer has a copy of Diseases of the Horse and Diseases of Cattle issued by the Department of Agriculture at Washington, and additional pamphlets on every known disease, with instructions in the use of serums, care and treatment of horses, cattle, sheep, swine and dogs. Further, the veterinary supply houses broadcast their products both medicinal and biological with instructions in the use of the hypodermic syringe where indicated. There is small chance of slaying any more lions in veterinary practice.—W. J. Lynch, Portland, Maine.

WATER BEFORE DAIRY COWS INCREASES YIELD

Experiments conducted at the Federal dairy farm at Beltsville, Md., on the drinking habits of dairy cows indicate that a greater quantity of water will be utilized when available at all times than when offered but once a day. Cows watered but once a day not only drank less but also produced less milk than when watered at will from watering cups. Cows watered twice a day drank as much as when watered at will, but did not produce so much milk.

The cows used in the tests were average producers, and the maximum difference found in production between watering once a day and at will, was only about 5 per cent. The higher the production, however, the greater the benefit to be derived from frequent watering.

Some low-producing cows fed silage, hay, and grain refused to drink more than once a day in cold weather. With cows of similar production and receiving the same kind of feed, water consumption was 80 per cent greater in hot summer than in cold winter weather. The demand for water was greatest after eating hay. In cold weather cows prefer water that has been warmed, and will drink more of it, though experiments at several stations show that the amount of production is influenced but little by warming the drinking water.

Less water is required when large quantities of such feeds as beets or mangels are fed.

THE BACTERIOPHAGE

We should always take the attitude of tempering scientific enthusiasm with judgment and of waiting for sound and valid demonstration before we become unduly excited over new discoveries, but the work of d'Herelle and others, in connection with the bacteriophage, seems now to have reached a stage where we have reason to feel that we are on the eve of revolutionary announcements in the field of biology and medicine.

Dr. F. de'Herelle is no unknown and oversanguine youngster, but a very distinguished scientist with years of solid and valuable work, done in many lands, behind him, and has been the recipient of some of the highest honors which various learned bodies in Europe can confer upon an investigator. It is, therefore, hardly conceivable that he would make what bids fair to prove an epoch-making announcement before he had convinced himself of its validity beyond the possibility of a reasonable doubt.

Briefly, the story of his discovery runs thus: in 1900, in Mexico, while investigating an epidemic disease of locusts, he noticed that, in making cultures on agar from the feces of infected insects in the later or convalescent stages of the disease, he obtained colonies which showed an irregular contour or in which there were small, circular areas entirely free from growth. These observations stimulated his interest and led to further investigations.

His next studies dealt with Shiga's dysentery bacillus, and after following false trails through many laborious experiments, he found that, in cases of dysentery, at a time when the patient took a turn for the better, a bouillon culture from the feces, grown over night and filtered, would, when the filtrate was added to a heavy culture of Shiga bacilli and incubated for ten hours, cause the complete disappearance of the organisms. When cultures to which the filtrate had been added were grown on agar slants for a few hours the same circular

clear spots appeared as had been seen on the cultures from the locust epizoötic.

From these and many other elaborate experiments, d'Herelle at length came to the decision that he had found an ultramiscroscopic organism which grew as a parasite upon certain types of bacteria and destroyed them, in somewhat the same way that the bacteria destroy their human or other hosts. This organism, or type of organisms, he gave the name of the bacteriophage, meaning "that which develops at the expense of bacteria."

Further studies revealed that the bacteriophage was not simply one organism, but that there are a number of different varieties, each developing at the expense of one particular kind of bacteria and having no effect upon others—in other words, that the various bacteriophages are specific.

To set forth in detail the various experiments by means of which d'Herelle arrived at these startling conclusions has required a volume of nearly 600 pages, most of which is of interest chiefly to laboratory workers, but several facts of clinical importance have already emerged.

Extensive experiments have shown that it is possible, by the injection of the bacteriophage, to immunize animals against a number of virulent bacterial infections.

In order to assure himself that the bacteriophage is harmless to man, d'Herelle himself took, by mouth, increasing quantities of Shiga bacteriophage cultures up to 30 cc., and hypodermic injections of 1 cc., without causing any reactions or unpleasant symptoms whatever. He also fed the cultures to several member of his family with the same results. Other workers have received as much as 5 cc. of these cultures, subcutaneously, without discomfort. In all cases the specific Shiga bacteriophage was recovered from the stools after twenty-four hours.

He was then ready to begin therapeutic experiments, and these were carried out upon proved cases of bacillary dysentery of the Shiga type. All of these cases had Shiga bacilli in their stools, and none of them showed a specific bacteriophage either for the Shiga bacillus or for the types of Flexner or Hiss. Some of the first cases were very severe, and all were treated with the bacteriophage, and nothing else. All showed marked improvement within twelve to forty-eight hours and all recovered. In Brazil, following the work of Dr. de Costa Cruz, of Rio de Janeiro, all other forms of treatment for dysentery are said to have been largely discontinued.

A number of cases of typhoid have been treated in this manner and the results have been astonishing. In most cases there was a crisis, with sweating, within a few hours after the administration of the bacteriophage, and the temperature returned permanently to normal within twenty-four to forty-eight hours.

B. Coli infections of the kidneys and bladder, local and general staphylococcus infections, bubonic plague and several other diseases have already been successfully treated by means of phagotherapy.

The experiments of d'Herelle have demonstrated that the bacteriophage behaves, in practically all ways, like other types of microorganisms. It can be grown in cultures; passed through animals and man and recovered; exalted or attenuated in virulence, etc. Some other workers are now even reporting the development of an antibacteriophagic substance, analogous to antitoxins against bacteria.

Nor has the work of this great Frenchman stood alone, as is attested by a bibliography of more than 600 references, appended to his recent book; and the number of these references multiplies as enthusiastic workers all over the world take up this fascinating study.

What may all this mean to us, as physicians? Only the future can answer. But one can almost see a vision of a time when bacterial diseases will be a thing of the past—when, a specific bacteriophage having been developed against all known forms of microscopic invaders of the human host, all that will be necessary when any infectious disease declares itself will be to administer a few doses of the proper culture and the patient will recover.

And if this be possible, why may we not foresee a day when all human beings will

KANSAS STATE AGRICULTURAL COLLEGE LIBRARY OCT 5 1926

be immunized, in childhood, against every type of microorganism that is likely to attack them, so that our descendants will live, in health, until they die of old age or as a result of accidents? Perhaps we are on the eve of one of those momentous biological inventions, discussed by Haldane in his "Dedaelus."—Clinical Medicine.

LEGUME HAYS FOR CHICKENS

Green feed or its equivalent is one of the most vital parts of the ration for chickens and it is that part of the diet which many poultry keepers find the greatest difficulty in providing. It is believed that without green feed or its equivalent no ration can prove successful. It seems that more poultry keepers fail to meet this than any other feeding requirement. In summer the best solution of the green feed problem is a good range. During the late summer and fall, when the range becomes depleted, a generous supply of early cabbage or swiss chard is probably best. But the big problem is during the winter months.

The winter supply of green feed is usually limited and it is difficult to store. In various feeding trials conducted by the Station to learn whether there are any satisfactory substitutes or equivalents for green feed, surprisingly favorable results were obtained from the use of legume hays. While no direct comparisons were made with succulent green feed and the legume hays, yet the results were equal, if not superior, to what we would expect according to our previous experience in feeding greens in the succulent form. The first year's test with alfalfa gave the highest winter egg production of the rations enumerated. Soybean hay gave surprisingly good results. It was also fed to 220 other pullets and they laid especially well and the mortality was low.

It would seem from these results that high quality, green, leafy alfalfa, red clover, or soybean hay may be effectively substituted for succulent green feed, especially during the fall and winter months.

How hay is fed to chickens.—A satisfactory way is to cut the hay in ½-inch lengths by passing it through a cutter. The cut hay can then be put into a wire netting basket feeder, and kept before the birds all the time. Or the hay without cutting can be fed in suitable wall racks with the front inclosed by lath or wire netting. Still another method is to tie a bundle of the hay with a small rope and suspend it from the ceiling so the center of the bundle is about ten inches above the floor.

Kinds and quality of hays.—Alfalfa, red clover, and soybean hay are satisfactory. Results thus far secured indicate these hays to be about equally valuable. Regardless of the kind of hay, it is necessary that it be made from the immature plant so as to carry a large proportion of leafy material. It is the leafy portion that carries the valuable constituents for chickens. The hay should be of high quality, which means that it must be carefully cured without getting wet, so that it will have as green a color as possible. Sometimes it may be necessary to cure the hay inside, although sun-cured hay is regarded as being superior in some respects to that cured without exposure to direct sunlight. Usually the second or third cuttings of clover and alfalfa are best. Soybean hay should be cut when the seeds are just beginning to form in the pods. At this stage a large proportion of the hay is leafy, palatable, and of a high protein content.

In various feeding trials at this Station during the last three years, alfalfa hay gave uniformly good results. Needless to say it is easier to provide a uniform, dependable supply of legume hay for the winter season than succulent green feed, and, furthermore, the hay involves much less labor of feeding. —Kennard and Nettleton, Ohio Experiment Station Bulletin No. 121.

Chronic coccidiosis in fowls can be differentiated from parasitism only by a careful autopsy and microscopic examination of the intestinal mucosa.

Comb picking in chickens is a habit that is usually induced by an injury to the comb. As a rule comb picking is indulged in by many fowls in a flock. This habit can be prevented by removing any bird that has an injured comb.